CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
CENTRAL VALLEY REGION

ORDER R5-2014-0030-06

WASTE DISCHARGE REQUIREMENTS GENERAL ORDER FOR GROWERS WITHIN THE SACRAMENTO RIVER WATERSHED THAT ARE MEMBERS OF A THIRD-PARTY GROUP

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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 owners and operators of irrigated lands within the Order Watershed Area described below in Finding three (3), excluding land where commercial rice, species *Oryza sativa,* is currently being grown and is covered under a separate Irrigated Lands Regulatory Order Program. Either the owner or operator may enroll an irrigated lands parcel under this Order. The owners or operators that enroll the respective irrigated lands parcels are considered members of a third-party representing all or a portion of this area (hereafter "Members"). The Member is required to provide written notice to the non-Member owner or operator that the parcel has been enrolled under the Order. Enforcement action by the board for non-compliance related to an enrolled irrigated lands parcel may be taken against both the owner and operator. This Order contains eligibility requirements for a third-party representative and describes the process by which the Executive Officer may approve a request for third-party representation. This Order applies throughout the Sacramento River Watershed, within which one or more third parties may represent Members based on geographic area. If multiple third parties apply to serve different portions of the Sacramento River Watershed, the applications, along with the proposed boundaries of third-party responsibility, shall be coordinated to ensure that all areas within the Sacramento River Watershed may be represented by a third-party.

3 The Order Watershed Area includes all of the Sacramento River Watershed, which is bounded by the crest of the Sierra Nevada Mountain Range to the east, the Oregon border to the north, the Coast Range and Klamath Mountains to the west, and the Sacramento and San Joaquin County lines to the south. In addition, the Order Watershed Area includes all of El Dorado County and the parts of Amador County that are in the following CalWater Hydrologic Areas[2]: Lower Cosumnes-Dry Creek; Sutter Creek; Cosumnes; and South Fork American. This area is

[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] See CalWater 2.2 at http://ceres.ca.gov/catalog?catalog=DigitalAtlas_639&ds=CalWater22_16789

also referred to as the "third-party area" in this Order. See Figure 1 for a map of the third-party area.

There are some locations within the Sacramento River Watershed where it may be more effective for owners and operators of irrigated lands that are not "Members" to enroll under an Irrigated Lands Regulatory Program (ILRP) order that recognizes a different third-party representative. Growers are only required to obtain coverage under one ILRP order.

4 "Irrigated lands" means land irrigated to produce crops or pasture used for commercial purposes including lands that are planted to commercial crops that are not yet marketable (e.g., vineyards and tree crops). Irrigated lands also include nurseries, and privately and publicly managed wetlands (excluding the non-irrigated upland habitat associated with managed wetlands).

5 This Order is not intended to regulate water quality as it travels through or remains on the surface of a Member's agricultural fields or the water quality of soil pore liquid within the root zone.[3]

6 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 of WDRs 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 irrigated lands must obtain regulatory coverage for any discharges of waste that are not regulated by the other WDRs/waiver. Such regulatory coverage may be sought through enrollment under this Order or by obtaining appropriate changes in the owner/operator's existing WDRs or waiver.

7 This Order implements the long-term Irrigated Lands Regulatory Program (ILRP) in the Sacramento River Watershed. The long-term ILRP has been conceived as a range of potential alternatives and evaluated in a programmatic environmental impact report (PEIR).[4] The PEIR was certified by the Central Valley Water Board on 7 April 2011; however, the PEIR did not specify any 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 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 irrigated lands within the Sacramento River Watershed. Existing Members that had previously enrolled under the Coalition Group Conditional Waiver will be enrolled under this Order upon timely submittal of a Notice of Confirmation (see section VII.A of this Order).

GROWERS REGULATED UNDER THIS ORDER

8 This Order regulates both landowners and operators of irrigated lands from which there are discharges of waste that could affect the quality of any waters of the state. In order to be covered by this Order, the landowners or operators must be Members. Because this Order regulates both landowners and operators, but does not require enrollment of both parties, the

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

[4] 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

provisions of this Order require that the Member provide notification to the non-Member responsible party of enrollment under this Order. A third-party group representing Members will assist its Members in complying with the requirements of this Order. Both the landowner and operator are ultimately responsible for complying with the terms and conditions of this Order.

9 A third-party entity proposing to represent Members in the Sacramento River Watershed, or a portion thereof, (the third-party) is required to submit to the Central Valley Water Board an application to represent growers within this Order's coverage area or identify the area the third party proposes to cover. The third-party representation will become effective upon Central Valley Water Board Executive Officer approval of the third party's application. If a third-party proposes to cover a portion of the Order's coverage area, the Executive Officer will determine and identify the geographic area covered by the third-party in the Notice of Applicability. The Sacramento Valley Water Quality Coalition served as the third-party group representing owners and operators of irrigated lands within portions of the Order watershed area during the interim irrigated lands regulatory program, Order R5-2006-0053 (Coalition Group Conditional Waiver).

10 The third-party will be 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 R5-2014-0030-06 (MRP). By retaining its third-party membership or establishing a new membership, a Member is agreeing to be represented by the third-party for the purposes of this Order. Any requirements or conditions not fulfilled by the third-party are the responsibility of the individual Member. The Member and non-Member owners and operators are responsible for conduct of operations on the Member's enrolled property.

11 To apply for coverage under this Order, a grower that is not a current Member in the third-party group will enroll under this Order by obtaining membership in the applicable third-party group (see section VII.A of this Order for specific requirements).

REASON FOR THE CENTRAL VALLEY WATER BOARD ISSUING THIS ORDER

12 The Sacramento River Watershed region has approximately 2.36 million acres of cropland under irrigation and approximately 15,000 growers with "waste discharges from irrigated lands," as defined in Attachment E to this Order. Currently, approximately 27,000 acres are regulated under the Water Board's General Order for Existing Milk Cow Dairies (R5-2007-0035), 1.2 million acres are regulated under the Coalition Group Conditional Waiver through the Sacramento Valley Water Quality Coalition, and 556,000 acres are regulated under the Coalition Group Conditional Waiver through the California Rice Commission. Approximately 12,000 growers and 1,777,000 associated irrigated acres including managed wetlands will require regulatory coverage under this Order or other WDRs or conditional waivers of WDRs.[5]

13 The Sacramento River Watershed region contains all or portions of 62 groundwater basins and 96 groundwater sub basins. The Sacramento River Watershed area has approximately 29,000 linear miles of surface water courses that are, or could be, affected by discharges of waste from irrigated lands. This does not include surface water courses in the mountainous regions of the third-party area where there are no irrigated lands operations. Discharges of waste from irrigated lands could adversely affect the quality of the "waters of the state," as defined in Attachment E to this Order.

[5] Data are for the 21 Counties that comprise the Sacramento River Watershed area; United States Department of Agriculture. 2007. *Census of Agriculture*.

14 Within the third-party area, there are approximately 192,000 acres of irrigated lands within Department of Pesticide Regulation (DPR) Groundwater Protection Areas (GWPAs). DPR identifies these areas as vulnerable to groundwater contamination from the agricultural use of certain pesticides, based upon either pesticide detections in groundwater or upon the presence of certain soil types (leaching and/or runoff area) and a depth to groundwater shallower than 70 feet. Of the 192,000 acres, approximately 39,000 acres of the irrigated lands are within DPR GWPAs that are characterized as vulnerable to leaching of pesticides (leaching areas), approximately 152,000 acres are within GWPAs that are characterized as vulnerable to movement of pesticides to groundwater by runoff from fields to areas were they may move to groundwater (runoff areas), and 600 acres of irrigated lands are characterized as both leaching and runoff areas. For leaching areas, certain water soluble pesticides are carried mainly with excess irrigation water or rainwater through the soil profile and potentially to the underlying aquifer. For runoff areas, certain water soluble pesticides are carried mainly with runoff over the land surface to potential conduits to groundwater. However, DPR has not established or analyzed the GWPAs with fertilizers and nitrate in mind, and its GWPAs are established based upon detections of certain pesticides, many of which are of lower solubility. Solubility is one factor that can lead to groundwater contamination. Depending on the frequency of application and amount applied, certain water soluble constituents, such as nitrate, may share common pathways to groundwater with soluble pesticides. This Order includes consideration of DPR's vulnerability factors and GWPAs by the third-party in the determination of high vulnerability areas for nitrate.

15 The Central Valley Water Board's *Irrigated Lands Regulatory Program Existing Conditions Report* (ECR)[6] identifies waters of the state with impaired water quality attributable to or influenced by irrigated agriculture, including within the third-party area. The *Irrigated Lands Regulatory 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…"*

16 Approximately 102 water bodies encompassing 2,600 linear miles of surface water courses have been listed as impaired pursuant to Clean Water Act section 303(d)[7] within the third-party area. Approximately 29 of those water body listings identify the potential source of the impairment as agriculture, and the remaining water body listings identify an unknown source of impairment.

17 Elevated levels of nitrates in drinking water can have significant negative health effects on sensitive individuals. The Basin Plan contains a water quality objective for nitrate to protect the drinking water uses. The water quality objective for nitrate is the maximum contaminant level (MCL) of 10 mg/L for nitrate plus nitrite as nitrogen (or 45 mg/L of nitrate as nitrate) established by the California Department of Public Health (22 CCR § 64431) that has been set at a level to protect the most at-risk groups – infants under six months old and pregnant women.[8]

In some areas, nitrate from both agricultural and non-agricultural sources has resulted in degradation and/or pollution of groundwater beneath agricultural areas in the Central Valley.[9] Available data (see Information Sheet and the PEIR) indicate that there are wells, including water supply and environmental monitoring wells, within the Sacramento River Watershed that have exceeded the MCL for nitrate. As established in the Basin Plan, groundwater in the

[6] California Regional Water Quality Control Board, Central Valley Region, and Jones and Stokes. 2008. *Irrigated Lands Regulatory Program Existing Conditions Report.* Sacramento, CA.
[7] The 2008-2010 303(d) List was the most current list when this Order was adopted in March 2014.
[8] See, for example, the California Department of Public Health Nitrate Fact Sheet: http://www.cdph.ca.gov/certlic/drinkingwater/Documents/Nitrate/FactSheet-Nitrate-05-23-2012.pdf
[9] PEIR, Appendix A

Sacramento River Watershed has been designated, for drinking water (MUN) uses; therefore the water quality objective of 10 mg/L for nitrate plus nitrite (as nitrogen) applies to groundwater in the Sacramento River Watershed. Where nitrate groundwater quality data are not available, information on the hydrogeological characteristics of the area suggest that portions of the Sacramento River Watershed may be vulnerable to nitrate contamination. Sources of nitrate in groundwater may include leaching of excess fertilizer, confined animal feeding operations, septic systems, discharge to land of wastewater, food processor waste, unprotected well heads, improperly abandoned wells, and lack of backflow prevention on wells.

18 The Central Valley Water Board's authority to regulate waste discharges 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).

19 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 irrigated agricultural lands in the Sacramento River Watershed includes: (a) discharges are produced by similar operations (irrigated agriculture); (b) waste discharges under this Order involve similar types of wastes (wastes associated with farming); (c) water quality management practices are similar for irrigated agricultural operations; (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 geology and the climate are similar, which will tend to result in similar types of water quality problems[10] and similar types of solutions.

20 Whether an individual discharge of waste from irrigated 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, crop type, management practices and other site-specific factors. These individual discharges may also have a cumulative effect on waters of the state. Waste discharges from some irrigated lands have impaired or degraded and will likely 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 California Water Code Division 7).

21 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*

[10] "Water quality problem" is defined in Attachment E.

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 secret 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."

22 Technical reports are necessary to evaluate Member 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 Member waste discharges on water quality, to verify the adequacy and effectiveness of the Order's conditions, and to evaluate Member 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 third-party 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 for development of the Groundwater Quality Assessment Report. The Executive Officer will review third-party proposed high and low vulnerability area designations and make the final determination of vulnerability. High and low vulnerability areas will be reviewed and updated throughout the implementation of this Order. A Member who is covered under this Order must comply with MRP Order R5-2014-0030-06, which is part of this Order, and future revisions thereto by the Executive Officer or board.

23 The water quality monitoring under this Order is representative in nature and does not measure individual field discharge. The benefits of representative monitoring include the ability to determine whether water bodies accepting discharges from numerous irrigated lands are meeting water quality objectives and to determine if existing high quality waters are being maintained. Further, representative monitoring allows the Regional Board to determine whether represented practices are protective of water quality. There is a cost savings with representative monitoring, since all surface waters or all groundwater aquifers that receive irrigated agricultural discharges do not need to be monitored. Surface water and groundwater monitoring sites are selected to represent areas with similar conditions (e.g., crops grown, soil type).

Therefore, through the reporting and evaluation of applied nitrogen versus removed nitrogen, the Management Practices Evaluation Program, development and utilization of Groundwater Protection Targets, the Surface Water Quality Management Plans and Groundwater Quality Management Plans, the third-party must evaluate the effectiveness of management practices in protecting water quality. In addition, Members must report the practices they are implementing to protect water quality and comply with Surface and Groundwater Quality Management Plans as applicable. Through the evaluations and studies conducted by the third-party, the reporting of applied and removed nitrogen as well as the management practices used by the Members, and the board's compliance and enforcement activities, the board will be able to determine whether a Member is complying with the Order.

Where required monitoring, evaluations, and reporting 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 third-party or individual Members to provide technical reports. Such technical reports are needed when monitoring or other available information is not sufficient to determine the effects of irrigated agricultural waste discharges on state waters. It may also be necessary for the Central Valley Water Board to conduct investigations by obtaining information directly from Members 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 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.

24 The Central Valley Water Board's *Water Quality Control Plan for the Sacramento River and San Joaquin River Basins* (hereafter Basin Plan) and the State Water Resources Control Boards *Water Quality Control Plan for the San Francisco Bay/Sacramento-San Joaquin Delta Estuary* (hereafter Bay-Delta Plan) designate beneficial uses, establishes water quality objectives, contain programs of implementation needed to achieve water quality objectives, and reference 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 26 and 27.

25 This Order implements the Basin Plan, the Bay-Delta 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 discharges on water quality and the effectiveness of management practices designed to comply with applicable water quality objectives.

26 Pursuant to the Basin Plan, the Bay-Delta 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 River Watershed may include:

a. Municipal and Domestic Supply
b. Agricultural Supply
c. Industrial Service Supply
d. Industrial Process Supply
e. Hydropower Generation
f. Water Contact Recreation
g. Non-Contact Water Recreation
h. Warm Freshwater Habitat
i. Cold Freshwater Habitat
j. Migration of Aquatic Organisms
k. Spawning, Reproduction and/or Early Development
l. Wildlife Habitat
m. Freshwater Replenishment
n. Rare, Threatened, and Endangered Species
o. Groundwater Recharge

p. Preservation of Biological Habitats of Special Significance
q. Navigation
r. Shell Fish Harvesting
s. Commercial Sport Fishing
t. Estuarine Habitat

27 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

28 The board recognizes that there may be some areas within Sacramento River Watershed that overlie groundwater containing naturally occurring constituents, including salts, that may exceed water quality objectives for specific beneficial use designations. In such cases, the use may be unattainable, even in the absence of any waste discharge, and de-designation or modification of the designated use may be appropriate. It is reasonable, under circumstances described below, to delay the imposition of monitoring and reporting associated with high vulnerability areas in these circumstances. This Order allows, with Executive Officer approval, portions of the high vulnerability areas identified within the Groundwater Quality Assessment Report (GAR) to temporarily operate under reduced monitoring and reporting requirements when 1) a third-party, board, or other group is actively pursuing a basin plan amendment to de-designate or modify the beneficial use, and 2) the third-party provides the required information indicating that it is reasonably likely that the beneficial use is not appropriate in the area of the proposed de-designation. The requirements for pursuing reduced monitoring and reporting as a condition of a basin plan amendment are described in section VIII.M of this Order and section V.G of the MRP.

29 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 to 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.

30 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.

31 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.

32 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

33 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.

34 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 regulated Members 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).

35 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 are expected to include implementation of water quality management practices and monitoring well installation and operation. Attachment A of this Order describes example 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. Also, because the cost of this Order is expected to fall within the range of costs described for Alternatives 2 through 6, significant impacts to agriculture resources under this Order will be similar to those described in the PEIR. 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.

36 Where potentially significant environmental impacts identified in Attachment D may occur as a result of Members' compliance activities, this Order requires that Members 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.

37 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

38 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 authorized degradation of existing high quality waters is subject to 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.

39 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).

40 Appendix A to the PEIR for the Irrigated Lands Program describes 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.

41 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

42 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 within the Sacramento River Watershed, is based on Alternatives 2-6 of the PEIR; therefore, estimated costs of this Order fall within the Basin Plan cost range.[11] The total average annual estimated 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 $8.58 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 within the Sacramento River Watershed is expected to be approximately 172 million dollars per year ($97.06 per acre annually). The total estimated average cost of compliance with this Order is expected to be approximately 187 million dollars per year ($105.64 per acre annually).

Approximately $97.02 of the estimated $105.64 per acre average annual cost of the Order is associated with implementation of management practices. This Order does not require that Members implement specific water quality management practices.[12] Many of the management practices that have water quality benefits can have other economic and environmental benefits (e.g., improved irrigation can reduce water and energy consumption, as well as reduce runoff). Management practice selection will be based on decisions by individual Members in consideration of the unique conditions of their irrigated agricultural lands; 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 Members 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 third-party 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 Members covered by this Order is $0.75/acre. The combined total estimated average administrative costs that include third-party and state fees are estimated to be $6.32/acre annually or less than 6% of

[11] 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 (irrigated lands in Sacramento River Watershed).

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

the total estimated cost of $105.64 per acre. These costs have been estimated using the same study used to develop the Basin Plan cost estimate, which applies to the whole ILRP being overseen by the Central Valley Water Board. The basis for these estimates is provided in the *Draft Technical Memorandum Concerning the Economic Analysis of the Irrigated Lands Regulatory Program.*[13] Attachment A includes further discussion regarding the cost estimate for this Order.

43 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.

44 The costs associated with the new requirements in Order R5-2014-0030-06 were estimated by the State Water Board in WQO Order 2018-0002.[14] The Central valley Water Board has reviewed those estimates and has considered them when adopting this Order.

RELATIONSHIP TO OTHER ONGOING WATER QUALITY EFFORTS

45 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.

46 On 31 May 2018, the Central Valley Water Board adopted amendments to the Basin Plan to implement the Salt and Nitrate Management Plan that was developed through the collaborative, stakeholder process known as the Central Valley Salinity Alternatives for Long-Term Sustainability initiative (CV-SALTS). The amendments include, in part, implementation provisions for a Nitrate Control Program and Salinity Control Program. The amendments as adopted by the board are currently pending before the State Water Board and must be approved by the State Water Board and the Office of Administrative Law prior to becoming effective. It is this board's intent to require growers in the Sacramento River Watershed subject to the terms of this Order to comply with applicable provisions of the Nitrate Control Program and the Salinity Control Program upon such provisions becoming effective and upon revision of this Order requiring compliance.

47 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

[13] 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
[14] State Water Resources Control Board, WQO Order 2018-0002, p. 68-73.

Board as Basin Plan amendments, is the sum of allowable loads of a single pollutant from all contributing point sources and nonpoint sources. This Order implements all current and future TMDLs to the extent there are established requirements that pertain to irrigated agriculture.

48 The General Order for Existing Milk Cow Dairies (R5-2007-0035) and NPDES Dairy General Permit CAG015001 (Dairy General Orders) regulate discharges of waste to surface waters and groundwater from existing milk cow dairies in the Central Valley. Discharges from irrigated agricultural parcels are regulated by the Dairy General Orders if the owner or operator of the parcel applies dairy waste from its dairy operation. Irrigated agricultural parcels that receive dairy or other confined animal facility[15] waste from external sources must obtain regulatory coverage for their discharge under this Order or waste discharge requirements that apply to individual growers. The Central Valley Water Board encourages the dairy industry and the third-party to coordinate the surface water and groundwater quality monitoring required of the two orders and to coordinate their response to identified water quality problems.

49 This order excludes all land that is planted to commercial rice (*Oryza sativa*), which will be covered by a General Order for Sacramento Valley Rice Growers that will authorize the California Rice Commission to represent rice growers with respect to waste discharge requirements on that land. If land that has been previously planted to rice is subsequently planted with another crop, the owner or operator of that land must obtain regulatory coverage under this or another order. The Order for Rice Growers does not include wild rice, so growers of wild rice must obtain regulatory coverage under this or another order.

50 The Executive Officer approved the Sacramento Valley Water Quality Coalition Management Plan on 2 February 2009. This plan is intended to include implementation of approved TMDLs as described in Finding 46. This plan (along with updates and modifications approved by the Executive Officer) will continue to be implemented under this Order to address the surface water quality problems identified therein, unless and until such time the Executive Officer requires modification of the plan or deems it to be complete, as described in this Order. Management Plans required based on data gathered under the Conditional Waiver, which have not been approved by the date the Order is adopted, will be completed in accordance with the requirements of Appendix MRP-1 of this Order. Any request to consider management plans approved under the Conditional Waiver complete will be evaluated in accordance with this Order.

51 The Delta Regional Monitoring Program (Delta RMP) is a comprehensive program currently being developed by the Central Valley Regional Water Board in collaboration with Delta dischargers and other organizations. The goal of the Delta RMP is to develop a comprehensive and coordinated monitoring program across the many entities that currently conduct monitoring in the Delta, including the agricultural coalitions. Based on the success of similar programs, it is anticipated that this effort will lead to opportunities to fill data gaps related to contaminants, water quality impairment, and aquatic health and reduce redundant monitoring efforts and costs. This Order can be amended in the future to address changes in monitoring strategy that may result from the Delta RMP.

COORDINATION AND COOPERATION WITH OTHER AGENCIES

52 *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

[15] "Confined animal facility" is defined in Title 27 CCR section 20164 as "*… any place where cattle, calves, sheep, swine, horses, mules, goats, fowl, or other domestic animals are corralled, penned, tethered, or otherwise enclosed or held and where feeding is by means other than grazing.*"

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 irrigated agricultural discharges on groundwater. This Order requires the third-party to develop groundwater monitoring workplans and, where necessary, groundwater quality management plans (GQMPs). The third-party is encouraged to coordinate with local groundwater management plans and integrated regional water management plans, where applicable, when developing groundwater monitoring workplans and GQMPs.

53 *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 agricultural pesticides. 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.

54 *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. The University of California Agriculture and Natural Resources (UC ANR) and CDFA FREP developed and offers nitrogen management certification training for Certified Crop Advisors (CCAs). Between 2012 and 2015, eight training sessions were held, certifying approximately 800 CCAs statewide. A special training program has also been developed for training CCAs to become grower-trainers and provide grower training. Among other certification options available for irrigation and nitrogen management plans, the CDFA training programs will be recognized as providing the training necessary for a Member or CCA to certify irrigation and nitrogen management plans. In addition, this Order requires the preparation of irrigation and nitrogen management plans and submittal of summary reports. CDFA has had an active role in working with the agricultural community on the concepts related to the template and that role is expected to continue. This Order leverages CDFA's work and expertise with respect to nitrogen management training and technical support to the professionals and third-parties that will be developing irrigation and nitrogen management plans for individual Members.

55 *Nitrogen Management and Control* – In response to nitrate groundwater concerns, the Legislature enacted Chapter 1 of the Second Extraordinary Session of 2008 (SBX2 1, Perata), requiring the State Water Board to develop pilot projects focusing on nitrate in groundwater in the Tulare Lake Basin and the Salinas Valley, and to submit a Report to the Legislature.[16] In its report, the State Water Board made fifteen recommendations to address the issues associated with nitrate contaminated groundwater.

[16] State Water Board Resources Control Board. 2013. Report to the Legislature, Recommendations Addressing Nitrate in Groundwater. <http://www.swrcb.ca.gov/water_issues/programs/nitrate_project/docs/nitrate_rpt.pdf>

In fulfillment of Recommendation #11 of the Report to the Legislature, CDFA, in coordination with the Water Boards, convened the Nitrogen Tracking and Reporting Task Force (Nitrogen Tracking Task Force) to identify an appropriate nitrogen tracking and reporting system and to provide meaningful and high quality data to help CDFA and the water boards address groundwater quality nitrate issues in California. The Nitrogen Tracking Task Force included stakeholders and experts from agricultural organizations, academia, regulatory agencies, and the environmental advocacy community. The Task Force's Final Report[17] was released December 5, 2013, and made recommendations for a nitrogen tracking and reporting system. The recommended system addressed eight key topics including: (1) system structure; (2) data elements; (3) roles, responsibilities, and data accessibility; (4) benefits of participation; (5) verifiability; (6) societal benefits of the recommended system; (7) limitations; and (8) system phasing.

In fulfillment of Recommendation #14 of the Report to the Legislature, the State Water Board, in coordination with CDFA, convened the Agricultural Expert Panel to consider all existing studies, program, and efforts for agricultural nitrate control, including the recommendations of the Nitrogen Tracking Task Force. The Agricultural Expert Panel consisted of eight members with various areas of specialization including: an irrigation specialist/agricultural engineer, a soil scientist, a hydrogeologist, an agronomist, a certified crop advisor, a University of California Cooperative Extension farm advisor, a Central Coast grower, and a Central Valley grower. The Agricultural Expert Panel held multiple public meetings over a six-month period in Tulare, San Luis Obispo, and Sacramento to consider the questions posed to them by the State Water Board. In its assessment, the Agricultural Expert panel considered groundwater monitoring, tracking and reporting of nitrogen fertilizer application, estimates of nitrogen use efficiency or similar metric, and farm-specific nutrient management plans as source control measures and regulatory tools. The Agricultural Expert Panel Final Report[18] was presented to the State Water Board on September 23, 2014. In its Final Report, the Agricultural Expert panel recommended (in no particular order):

- Establishment of coalitions as an intermediate body between Members and regional boards;
- Adoption of a Nitrogen Applied to Nitrogen Removed Ratio (A/R Ratio) as the primary metric for evaluating progress on nitrogen source control;
- Development of strong, comprehensive, and sustained educational and outreach program;
- Creation and implementation of irrigation and Nitrogen Management Plans;
- Reporting of key values of crop type, acreage, total nitrogen applied, and total nitrogen removed by Members to the third-party;
- Trend groundwater monitoring for nitrate concentrations to track general aquifer conditions over multiple years;
- Targeted research to directly help the agricultural community to maintain and/or improve yields while simultaneously decreasing A/R ratio on individual fields;
- Analysis of reported values on a multiple-year basis to inform agricultural community of progress and sharpen improvement efforts.

56 *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)

[17] California Department of Food and Agriculture. 2013. Nitrogen Tracking and Reporting Task Force Final Report. <https://www.cdfa.ca.gov/environmentalstewardship/PDFs/NTRSTFFinalReport122013.pdf>
[18] State Water Resources Control Board. 2014. Conclusions of the Agricultural Expert Panel. http://www.swrcb.ca.gov/water_issues/programs/agriculture/docs/ILRP_expert_panel_final_report.pdf

provides cost share assistance for management practice installation. The NRCS has also provided assistance with research of management practice effectiveness. The third-party and its Members are encouraged to utilize the information and resources available through the NRCS to meet the requirements of this Order.

57 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

58 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.

59 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 Members 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 Member. The purpose of an informal enforcement action is to quickly bring the violation to the Member's attention and to give the Member 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 a priority include, but are not limited to:

a) Failure to obtain required regulatory coverage.
b) Failure to meet receiving water limitations, unless the Member is implementing a Central Valley Water Board approved SQMP or GQMP in accordance with the time schedule provisions of this Order (section XII).[19]
c) The discharge of waste to lands not owned, leased, or controlled by the Member without written permission from the landowner.
d) Failure to prevent future, avoidable exceedances of water quality objectives once made aware of an exceedance.
e) Falsifying information or intentionally withholding information required by applicable laws, regulations or an enforcement order.
f) Failure to implement a SQMP/GQMP.

[19] A Member participating in a Management Practices Evaluation Program study (i.e., the study is taking place on the Member's farm) where data indicate the discharge from the study area is not meeting receiving water limitations will not be a priority for enforcement, if the Member is implementing a Central Valley Water Board approved SQMP or GQMP in accordance with the time schedule provisions of this Order (section XII).

g) Failure to pay annual fees, penalties, or liabilities.
h) Failure to monitor or provide information to the third-party as required.
i) Failure to submit required reports on time.
j) Failure to implement the applicable management practices, or equivalent practices, identified as protective of groundwater in the Management Practices Evaluation Report.

60 Under this Order, the third-party is tasked with developing monitoring plans, conducting monitoring, developing water quality management plans, and informing Members of requirements. It is intended that the following progressive enforcement steps will generally be taken in the event that the third-party fails to comply with the terms and conditions of this Order or attached MRP:

a) First notification of noncompliance to the third-party. The Central Valley Water Board intends to notify the third-party of the non-compliance and allow a period of time for the third-party 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 to the third-party. If the third-party fails to adequately respond to the first notification, the board intends to provide written notice to the third-party and potentially affected Members of the failure to address the first notice.
c) Failure of the third-party to adequately respond to the second notification. Failure to adequately respond to the second notification may result in partial (e.g., affected areas or Members) or full disapproval of the third-party to act as a lead entity, depending on the severity of noncompliance. Growers that were Members affected by a partial or full third-party disapproval 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

61 This Order does not authorize violation of any federal, state, or local law or regulation.

62 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 Member shall obtain authorization for an incidental take prior to construction or operation of the project. The Member shall be responsible for meeting all requirements of the applicable Endangered Species Act.

63 This Order does not supersede the Central Valley Water Board's Basin Plans and policies, or the State Water Board's Bay-Delta Plan, including prohibitions (e.g., pesticides) and implementation plans (e.g., Total Maximum Daily Loads), or the State Water Board's plans and policies.

64 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.

65 This Order requires Members to provide the third-party with contact information of the person(s) authorized to provide access to the enrolled property for inspections. This requirement provides a procedure to enable board staff to contact grower representatives so that it may more efficiently monitor compliance with the provisions of this Order.

66 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.

67 All discharges from the irrigated agricultural 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.

68 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 Member.

69 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.

70 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.

71 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.

72 The Central Valley Water Board has notified interested agencies and persons of its intent to adopt this Order for discharges of waste from irrigated lands within the Sacramento River Watershed, and has provided them with an opportunity for a public hearing and an opportunity to submit comments.

73 The Central Valley Water Board, in a public meeting, heard and considered all comments pertaining to this Order.

74 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 Members of a third-party group[20], their agents, successors, and assigns shall comply with the following:

I. Coverage

1. Order 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 Members of the Sacramento Valley Water Quality Coalition in the Sacramento River Watershed.

2. The area to be covered by a third-party group will be identified in its Notice of Applicability (NOA). A third-party group receiving an NOA under this Order is responsible for all third-party group requirements within the geographic area identified in its NOA.

II. Prohibitions

1. The discharge of waste to waters of the state, from irrigated agricultural operations other than those defined in the Findings of this Order, is prohibited.

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 Member 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 Member 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 Member operations does not meet the limitations in **III.A Surface Water Limitations** or **III.B**. **Groundwater Limitations,** the Member is in compliance with this Order relative to sections III.A or III.B for a specific waste parameter provided:
   a. The third-party has submitted a Surface Water Quality Management Plan or Groundwater Quality Management Plan for that waste parameter in accordance with Section VIII.I of this Order, and such plan is pending action by the Executive Officer or board; or

[20] References to “the third-party group” in this Order apply to each of the entities (if more than one) that are approved as a third-party group under this Order.

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 Member 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 Member is in compliance with **Section XII. Time Schedule for Compliance** of this Order.

IV. Provisions

A. General Specifications

1. The third-party will assist its Members in complying with the relevant terms and provisions of this Order, including required monitoring and reporting as described in MRP Order R5-2014-0030-06. However, individual Members of the third-party group continue to bear ultimate responsibility for complying with this Order.

2. Irrigated lands owners or operators with waste discharges to state waters (or "Dischargers") that are not Members of the third-party group, or whose property is not enrolled by a Member of the third-party group, shall not be subject to coverage provided by the terms of this Order. Such Dischargers shall be required to obtain coverage for their waste discharge under individual waste discharge requirements or any applicable general waste discharge requirements that apply to individuals that are not represented by a third-party.

3. Members 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.

4. 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)[21] shall be mitigated in accordance with the mitigation measures provided in Attachment C of this Order.

5. 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 Members of the Third-Party Group

1. Members 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. All Members shall comply with the attached Monitoring and Reporting Program (MRP) R5-2014-0030-06, and future revisions thereto.

3. Members who are covered under this Order shall comply with the terms and conditions contained in this Order.

[21] 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.

4. Each Member[22] shall stay informed about agricultural water quality by participating in third-party sponsored outreach activities, at least annually. Participation may occur without in-person attendance. The Member 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 Member shall provide annual confirmation to the third-party that the Member has participated in an outreach activity during the previous year and reviewed the applicable outreach materials. Members who have no parcels in areas designated as high vulnerability are not required to commence participation in third-party outreach activities until 2020.

5. All Members shall provide the third-party with information requested for compliance with this Order.

6. All Members 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). Water quality management practices can be instituted on an individual basis or implemented to serve multiple growers discharging to a single location.

7. All Members shall implement effective sediment discharge and erosion prevention practices to minimize or eliminate the discharge of sediment above background levels. If Members are identified as having the potential to cause erosion and discharge sediment that may degrade surface waters or may cause a violation of an applicable water quality objective, then Members shall prepare and implement an individual Sediment and Erosion Control Plan as specified in section VII.C.1 below. Alternatively, as specified in section VII.C.2, Members may participate in the development and implementation of a watershed/subwatershed based (or collective) Sediment and Erosion Control Plan that includes collective management practices (e.g., sediment control basin at the bottom of a drainage area), in addition to individual management practices, for the control of sediment. Members may be identified as having the potential to cause erosion and discharge sediment that may degrade surface waters or may cause a violation of applicable water quality objectives through their Farm Evaluation, by the third-party in the Sediment Discharge and Erosion Assessment Report, or by the Executive Officer.

8. All Members shall implement practices that minimize excess nutrient application. Members shall prepare and implement a farm-specific irrigation and nitrogen management plan and submit a farm-specific irrigation and nitrogen management plan summary report as required by section VII.D of this Order.

9. In addition to the reports identified in section VII of this Order, the Executive Officer may require the Member 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 Member from liabilities under other federal, state, county, or local laws. However, enrollment under this Order does protect the Member 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.

[22] For the purposes of this provision only, the term “Member” or “Grower” includes “Designees”, provided that a Designee has responsibility for decisions related to management practices associated with farming operation.

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 Member understands that the Central Valley Water Board or its authorized representatives, may, at reasonable hours, inspect the facilities[23] and irrigated lands of persons subject to this Order to ascertain whether the purposes of the Porter-Cologne Act are being met and whether the Member is complying with the conditions of this Order. To the extent required by California Water Code section 13267(c) or other applicable law, the inspection shall be made with the consent of the Member, 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 Member shall provide the third-party with the phone number(s) of the individual(s) with authority to provide consent to access its facilities as described in provision IV.B.13 above.

15. The Member shall properly operate and maintain in good working order any facility, unit, system, or monitoring device installed to achieve compliance with the Order.

16. Settling ponds, basins, and tailwater recovery systems shall be constructed, maintained, and operated to prevent groundwater degradation, erosion, slope failure; and minimize the discharge of sediment. The construction and operation must be consistent with the applicable Natural Resources Conservation Service (NRCS) conservation practice standard, an NRCS or University of California Cooperative Extension recommendation, or an equivalent alternative standard.

17. Where applicable, the Member 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 Member shall follow the standards and guidelines described in the California Department of Water Resources' *Water Well Standards (Bulletins 74-81 & 74-90 combined)*.

18. The Member shall maintain a copy of this Order, either in hard copy or electronic format, at the primary place of business, or the Member's farming operations headquarters. The Member shall also maintain excerpts of the Order's Member requirements that have been provided by the Executive Officer so as to be available at all times to operations personnel. The Member and his/her designee shall be familiar with the content of this Order.

19. The Member, or the third-party on its Member's behalf as applicable, shall submit all required documents in accordance with section IX of this Order.

20. Members 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.

21. Members shall implement the applicable management practices, or equivalent practices, identified as protective of groundwater in the Management Practices Evaluation Report.

[23] The inspection of Member's facilities and irrigated lands does not include the Member's private residence.

C. Requirements for the Third-Party Group

In order to remain eligible to serve as a third-party representative to Members, the third-party shall perform the following:

1. Provide the Central Valley Water Board documentation of its organizational or management structure. The documentation shall identify persons responsible for ensuring that program requirements are fulfilled. The documentation shall be made readily available to Members.
2. Prepare annual summaries of expenditures of fees and revenue used to comply with this Order. The summaries shall be provided to or made readily available to Members.
3. If the third-party group receives a notice of violation (NOV) from the Central Valley Water Board, the third-party must provide to Members in the area addressed by the NOV appropriate information regarding the reason(s) for the violation. The notification must be provided to all Members within the area affected by the NOV within thirty (30) days of receiving the NOV from the board. The third-party group must provide confirmation to the board of each notification. A summary of all notices of violation received by the third-party group must be provided to all Members annually. The annual NOV summary may be part of a written or electronic communication to Members.
4. Develop and implement plans to track and evaluate the effectiveness of water quality management practices, pursuant to approved Surface Water Quality Management Plans and Groundwater Quality Management Plans.
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 45 days of receiving an NOA from the Central Valley Water Board (as described in section VIII.A), inform Members of this Order's requirements by providing a notice of the deadline and process required to complete the Notice of Confirmation and Farm Evaluation template.
8. Conduct education and outreach activities to inform Members of program requirements and irrigated agricultural water quality problems, including exceedances of water quality objectives or degradation of water quality, identified by the third-party or Central Valley Water Board. Outreach activities and materials shall include information on nitrogen application practices and the potential impact of nitrates on groundwater, as appropriate depending on the anticipated grower audience, shall be provided in appropriate languages. The third-party shall:
    a. Maintain participation lists for third party outreach activities, provide Members with information on water quality management practices that will address water quality problems and minimize the discharge of wastes from irrigated lands, and provide informational materials on potential environmental impacts of water quality management practices to the extent known by the third-party group.
    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 participated in the outreach activities. Activities may include annual County Agricultural Commissioner meetings, local Farm Bureau events (e.g., Spray Safe), and University of California Cooperative Extension (UCCE) workshops provided such events deliver the education and outreach described in this section. The annual education and outreach summary will also include the numbers of

newsletters received by growers with information on irrigated agricultural water quality exceedances and appropriate management practices to address the exceedances that Members can implement. The summary will describe how growers could obtain copies of the materials presented at these events.

c. By 31 December 2019, propose[24] an approach for defining a set of Members (outliers) with whom the third-party will follow up annually based on INMP Summary Report data (AR data). The approach is to be approved by the Central Valley Water Board Executive Officer after public notice and comment. The third-party may choose to apply the approach annually for a period of years to determine outliers, or the third-party may propose and seek approval of a different approach each year.

d. Provide additional INMP self-certification training for Members notified as being outliers for reported AR data and who opt not to use specialist for INMP certification. This INMP self-certification training shall be focused on assisting in reducing their overall $A/R_{3\ year}$ ratio and shall require in-person attendance.

9. Work cooperatively with the Central Valley Water Board to ensure that all Members are providing required information and taking necessary steps to address exceedances or degradation identified by the third-party or board. As part of the Membership List submittal required in section VIII.B., identify the growers known by the third-party who have: (1) failed to implement improved water quality management practices within the timeframe specified by an applicable SQMP/GQMP; (2) failed to respond to an information request from the third-party associated with any applicable SQMP/GQMP or other provisions of this Order; (3) failed to participate as requested in third-party studies for which the third-party is the lead; or (4) failed to provide confirmation of participation in an outreach activity (per section IV.B.4 of this Order).

10. Ensure that any activities conducted on behalf of the third-party by other groups meet the requirements of this Order. The third-party is responsible for any activities conducted on its behalf.

11. Collect any fees from Members 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 fees invoiced by the State Water Board will be based on the Membership List submitted by the third-party group. The third-party group 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 12 March 2014 and remains in effect as revised by the Central Valley Water Board on 5 June 2015, 2 October 2015, 19 February 2016, and 7 February 2019; unless rescinded or further revised by the Central Valley Water Board.

2. Regulatory coverage under this Order for discharges of waste from Member parcels already enrolled under Order R5-2006-0053 is effective upon adoption of this Order by the Central Valley Water Board. Regulatory coverage under this Order is automatically terminated, if a Notice of Confirmation (NOC) is not received by the third-party from the currently enrolled Member by 30 June 2015 or, if the third-party group application for the area in which the Member has irrigated lands is denied, or if the Central Valley Water Board revokes the approval of the third-party representing the Member's area.

[24] The approach may be proposed either solely or in conjunction with other third-party entities approved to represent owners and operators of irrigated lands within the Central Valley Region.

3. Regulatory coverage for Dischargers not already enrolled under Order R5-2006-0053 as of the date of adoption of this Order can be obtained directly through obtaining membership in the third-party group after Executive Officer issuance of a Notice of Applicability (NOA) to the third-party. Regulatory coverage is effective when the third-party notifies the Central Valley Water Board that the Discharger's application for membership has been accepted.

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* or the State Water Board *Water Quality Control Plan for the San Francisco Bay/Sacramento-San Joaquin Delta Estuary* (Bay-Delta Plan).

2. On 31 May 2018, the Central Valley Water Board adopted amendments to the Basin Plan to incorporate new strategies for addressing ongoing salt and nitrate accumulation in the waters and soils of the Central Valley as part of the Central Valley Salinity Alternatives for Long-Term Sustainability (CV-SALTS) initiative. Should the State Water Board approve the amendments to the Basin Plan to effectuate such strategies, this Order may be amended or modified to incorporate any newly applicable requirements.

3. The filing of a request by the third-party on behalf of its Members 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.

4. The third-party, on behalf of its Members, shall provide to the Executive Officer 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 requirements of this Order that apply directly to the third-party. Members shall provide to the Executive Officer, any information which the Executive Officer may request to determine whether cause exists for modifying, revoking and re-issuing, or terminating the Order as applied to the individual Member, or to determine compliance with the provisions of this Order that apply directly to the Member.

5. After notice and opportunity for a hearing, the Order may be terminated or modified for cause as applied to individual Members 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 Order coverage by misrepresentation; or
    c. Failure to fully disclose all relevant facts.

    A Member's regulatory coverage shall be automatically revoked if the NOC is not timely submitted (see section VII.A).

6. After notice and opportunity for a hearing, the approval of the third-party to act as a lead entity representing Members may be partially (e.g., affected areas or Members) or fully revoked. Cause for such termination or modification includes, but is not limited to consideration of the factors in Finding 59 of this Order, and/or:

a. Violation of any term or condition contained in the Order that applies directly to the third-party;
b. Third-party misrepresentation;
c. Failure by the third-party to fully disclose all known relevant facts; or
d. A change in any condition that results in the third-party's inability to properly function as the third-party entity representing Member interests or in facilitating Member compliance with the terms and conditions of this Order.

7. The Central Valley Water Board will review this Order periodically and may revise this Order when necessary.

VII. Required Reports, Monitoring, and Notices – Member

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 Member, and only to the extent that the Member has access to the equipment that allows for them to submit the information electronically. If the Member does not have such access, reports and notices must be submitted by mail. Reports and notices shall be submitted in accordance with section IX, Reporting Provisions, as well as Attachment B MRP Order R5-2014-0030-06. Due dates for Member required reports are summarized in Table 1 at the end of this Order. Members must prepare and maintain the following reports as instructed below and shall submit or make available such reports to the third-party or the Central Valley Water Board as identified below.

A. Notice of Confirmation / Notice of Intent / Membership Application

1. To confirm coverage under this Order, growers that are enrolled under Order R5-2006-0053 as Members of the Sacramento Valley Water Quality Coalition as of the effective date of this Order, must submit a completed notice of confirmation (NOC) to the third-party by 30 June 2015 (as provided by issuance of an NOA to the third-party, see section VIII.A of this Order). The third-party will provide a notice of requirements and process to complete NOC forms to Members within 45 days of receiving an NOA (see section VIII.A) from the Central Valley Water Board. As part of the NOC, Members must provide certification (i.e. written confirmation) that they have provided written notice to any responsible non-Member parties of the Member's enrollment under this Order and of the requirements of this Order (a responsible non-Member is a landowner whose parcel has been enrolled by an operator-Member under this Order or an operator who farms a parcel that has been enrolled by a landowner-Member). If the Member is a landowner that leases their land, the Member must provide the name and contact information of the lessee and provide updated information to the third-party should the lessee change. If the Member is the lessee, the Member must provide the name and contact information of the landowner and provide updated information to the third-party should the landowner change.

2. Within 120 days of Executive Officer issuance of an NOA to the third-party, all other growers within this Order's boundaries must become Members of the third-party. To obtain membership, a grower must submit a completed third-party Membership application to the third-party group. As part of the membership application, growers must provide certification that they have provided written notice to any responsible non-Member parties of the Member's enrollment under this Order and of the requirements of this Order. Upon submittal of a complete application, the third-party group may confirm membership, after which the Member will be considered covered under this Order. This provision does not apply to growers of rice who are covered by the General Order for Sacramento Valley Rice Growers, which authorizes the California Rice Commission to represent rice growers.

3. As an alternative to granting coverage under this Order, the Executive Officer may require the submittal of a report of waste discharge or issue an NOA for regulatory coverage under any applicable general waste discharge requirements for individual dischargers not represented by a third-party.

4. As an alternative to receiving regulatory coverage under this Order, a discharger may submit a report of waste discharge in accordance with California Water Code section 13260 or a Notice of Intent for regulatory coverage under any applicable general waste discharge requirements for individual dischargers not represented by a third-party.

B. Farm Evaluation[25]

Members shall complete a Farm Evaluation and submit a copy of the completed Farm Evaluation to the third-party group according to the schedule below.[26] The Member must use the Farm Evaluation Template approved by the Executive Officer (see section VIII.C below).

A copy of the Farm Evaluation shall be maintained at the Member's farming operations headquarters or primary place of business and must be produced upon request by Central Valley Water Board staff. In addition, Members shall comply with the following requirements where applicable:

1. All Members must submit the initial Farm Evaluation to the third-party by 1 March 2015.

2. Additional Terms for Members in Low Vulnerability Areas (Surface Water/Groundwater)

The Farm Evaluation must be updated and submitted to the third-party every five years starting on 1 March 2021.

3. Additional Terms for Members in High Vulnerability Areas (Surface Water/Groundwater)

An updated Farm Evaluation must be prepared and submitted to the third-party by 1 March annually through 1 March 2018. By 1 March 2021, and by 1 March every five years thereafter, Members must prepare and submit to the third-party an updated Farm Evaluation.

The Executive Officer may require more or less frequent submission of a Farm Evaluation for any Member or group of Members if the Executive Officer makes a determination that the change in frequency is warranted.

C. Sediment and Erosion Control Plans[27]

The requirements and deadlines of this section apply as specified to Members that are required to develop a Sediment and Erosion Control Plan per section IV.B.7 of this Order

1. Individual Sediment and Erosion Control Plan

All Members choosing to prepare and implement an individual Sediment and Erosion Control Plan must use the Sediment and Erosion Control Plan Template provided by the Executive Officer (see section VIII.C below), or equivalent. The Sediment and Erosion Control Plan must be prepared in one of the following ways:

[25] The Executive Officer issued a Managed Wetland Evaluation template that is to be used for managed wetlands and shall be updated and submitted according to the same schedule as the Farm Evaluation.
[26] Farm maps do not need to be provided to the third-party group.
[27] The requirement for a Sediment and Erosion Plan does not apply to parcels that are operated exclusively as a managed wetland.

a. The Sediment and Erosion Control Plan must adhere to the site-specific recommendation from the Natural Resources Conservation Service (NRCS), NRCS technical service provider, the University of California Cooperative Extension, the local Resource Conservation District; or conform to a local county ordinance applicable to erosion and sediment control on agricultural lands. The Member must retain written documentation of the recommendation provided and certify that they are implementing the recommendation; or

b. The Sediment and Erosion Control Plan must be prepared and self-certified by the Member, who has completed a training program that the Executive Officer concurs provides necessary training for sediment and erosion control plan development; or

c. The Sediment and Erosion Control Plan must be written, amended, and certified by a qualified professional possessing one of the following registrations or certifications, and appropriate experience with erosion issues on irrigated agricultural lands: California registered professional civil engineer, geologist, engineering geologist, landscape architect; NRCS Certified Conservation Planner; professional hydrologist registered through the American Institute of Hydrology; certified soil scientist registered through the American Society of Agronomy; Certified Professional in Erosion and Sediment Control (CPSEC)TM/Certified Professional in Storm Water Quality (CPSWQ)TM registered through EnviroCert International, Inc.; professional in erosion and sediment control registered through the National Institute for Certification in Engineering Technologies (NICET); or

d. The Sediment and Erosion Control Plan must be prepared and 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 Sediment and Erosion Control Plan meets the objectives and requirements of this Order.

The plan shall be maintained and updated as conditions change. A copy of the Sediment and Erosion Control Plan shall be maintained at the farming operations headquarters or primary place of business; and must be produced by the Member, if requested, should Central Valley Water Board staff, or an authorized representative, conduct an inspection of the Member's irrigated lands operation.

Members preparing an individual Sediment and Erosion Control Plan must do so within 180 days of the Executive Officer approving the third party's Sediment Discharge and Erosion Assessment Report.

2. Watershed/Subwatershed Based Sediment and Erosion Control Plan

Members that are required to develop a Sediment and Erosion Control Plan per section IV.B.7 of this Order may choose to participate in development and implementation of a watershed/subwatershed based (or collective) Sediment and Erosion Control Plan in lieu of preparing an individual Sediment and Erosion Control Plan.

Within 60 days of the Executive Officer accepting the third party's Sediment Discharge and Erosion Assessment Report, Members that opt to participate in the collective Plan must notify the Third Party of their intent to participate in the development and implementation of a watershed/subwatershed based (or collective) Sediment and Erosion Control Plan.

See section VIII.G for third-party requirements and deadlines for the Watershed/Subwatershed Sediment and Erosion Control Plan.

D. Irrigation and Nitrogen Management Plan, Data Supporting Nitrogen Applied/Removed Ratio, and Nitrogen Applied-Removed Difference[28]

All Members must prepare and implement an Irrigation and Nitrogen Management Plan (INMP) for each field[29] and submit the INMP Summary Report for the previous crop year, per the schedule detailed below. All Members in high vulnerability areas must have the INMP certified. The Member must use the INMP Template approved by the Executive Officer (see section VIII.C. below).

The Executive Officer may approve the use of multi-year INMPs for categories of crops that have consistent irrigation and nitrogen planning from year to year.[30] Multi-year plans cannot exceed three years in length, and if the Member decides to vary from the plan during its implementation period, a new INMP must be prepared, certified, and implemented. Members using multi-year INMPs must submit INMP Summary Reports annually. Utilization of a multi-year INMP remains at the discretion of the certifier.

INMP Summary Reports must include the necessary information for use by the third-party in calculating an Applied/Removed (A/R) ratio for nitrogen, and an Applied-Removed (A-R) difference for nitrogen, as defined in the equations below. The A/R ratio is the ratio of total Nitrogen Applied[31] (from sources including, but not limited to, organic amendments, synthetic fertilizers, manure, and irrigation water) to the total Nitrogen Removed[32] (including all harvested materials and nitrogen annually sequestered in permanent wood for perennial crops). The A-R difference is the difference of total Nitrogen Applied and the total Nitrogen Removed.

$$\text{A/R Ratio} = \frac{\text{Nitrogen Applied (from any source, including organic amendments, synthetic fertilizers, manure and irrigation water}}{\text{Nitrogen Removed (via harvest and annually sequestered in permanent wood of perennial crop}}$$

$$\text{A-R Difference} = \text{Nitrogen Applied} - \text{Nitrogen Removed}$$

Total Nitrogen Removed shall be determined, in part, by multiplying a member's crop yield by a crop-specific nitrogen coefficient, C_N, provided by the third-party, which represents the amount of nitrogen in the harvested crop. For some crops, the data needed to develop the C_N coefficient may not yet be available. The third-party is directed in Attachment B MRP Section V.D to determine, through nitrogen removed testing and research, the most appropriate C_N coefficients for converting crop yield to nitrogen removed.

$$\text{Nitrogen Removed (lbs/acre)} = \text{Crop Yield (units/acre)} \times C_N \text{ (lbs/unit)}$$

[28] The requirement for an Irrigation and Nitrogen Management Plan does not apply to irrigated pasture with no external nitrogen inputs, or to parcels that are operated exclusively as a managed wetland.
[29] Where this Order requires reporting by field, Members may report data for a portion of a field or for multiple fields provided that the reported area has (1) the same crop type, (2) the same fertilizer inputs, (3) the same irrigation management, and (4) the same management practices. In no case should a reported area exceed a total size of 640 acres, and different crop types must always be reported separately even if they are within the same reporting area.
[30] Whether a specific category of crops is appropriate for multi-year INMPs will depend on factors such as crop age, the level of variation of irrigation and fertilization practices from year to year, variation of cultivation practices, and climate zone. Likely candidates for multi-year INMPs include mature orchards that are managed consistently over multiple years.
[31] As defined in Attachment E.
[32] As defined in Attachment E.

The INMP and INMP Summary Report shall be maintained at the Member's farming operations headquarters or primary place of business. The Member must provide the INMP and INMP Summary Report to board staff, if requested, or should board staff or an authorized representative conduct an inspection of the Member's irrigated agricultural operation. The Member must submit the INMP Summary Report to the third-party in accordance with the schedule below. As provided in Attachment B MRP Section V, the third-party will provide certain INMP Summary Report data to the Executive Officer.

The INMP shall be certified in one of the following ways:

- Certified by an irrigation and nitrogen management plan specialist as defined in Attachment E of this Order. The specialist that certifies the INMP must be capable of answering questions relevant to the INMP and should be fully competent and proficient by education and experience in the field(s) relevant to the development of an INMP. These specialists may include Professional Soil Scientists, Professional Agronomists, Crop Advisers[33] certified by the American Society of Agronomy, Technical Service Providers certified in nutrient management in California by the National Resource Conservation Service (NRCS), or Certified Agricultural Irrigation Management Specialists certified by The Irrigation Association; or

- Self-certified by the Member who attends a California Department of Food and Agriculture or other Executive Officer approved training program for INMP certification. The Member must retain written documentation of their attendance in the training program; or

- Self-certified by the Member that the plan adheres to a site-specific recommendation from the Natural Resources Conservation Service (NRCS) or the University of California Cooperative Extension. The Member must retain written documentation of the recommendation provided; or

- Self-certified by the Member if the Member states that the Member applies no fertilizer to the field; or

- 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 INMP meets the objectives and requirements of this Order.

Members notified by the third-party as being outliers for reported AR data must have their INMP certified by an irrigation and nitrogen management plan specialist unless the Member receives additional self-certification training provided by the third-party.

1. ***Deadlines for Members within a High Vulnerability Groundwater Area***
   Members located within a high vulnerability groundwater area, for which nitrate is identified as a constituent of concern, must prepare and implement a certified INMP by 1 March 2020, and by 1 March annually thereafter.[34] By 1 March 2021, and by 1 March annually thereafter, Members

[33] Any Certified Crop Adviser who certifies an INMP must also have completed the nitrogen management training program offered by the University of California Agriculture and Natural Resources and the California Department of Food and Agriculture.
[34] For the period 1 March 2015 through 1 March 2019, Members in high vulnerability groundwater areas must prepare a Nitrogen Management Plan (NMP) in accordance with Order R5-2014-0030-05. The requirement to prepare a certified NMP annually commenced on 1 March 2016. For the period 1 March 2016 through 1 March

within a high vulnerability groundwater area must submit to the third-party the INMP Summary Report for the previous year.[34]

2. ***Deadlines for Members within a Low Vulnerability Groundwater Area***
By 1 March 2020, and annually thereafter, all Members within a low vulnerability groundwater area shall prepare an INMP[35]. By 1 March 2021, and by 1 March annually thereafter, all Members within low vulnerability groundwater areas shall submit to the third-party the INMP Summary Report for the previous year.

3. ***Exceptions to Nitrogen Management and Reporting Requirements***
   a) Any category of Members (such as growers of a particular crop or growers in a particular area) seeking to be exempted from the nitrogen management requirements in this section shall make a demonstration, for approval by the Regional Board, that nitrogen applied to the fields does not percolate below the root zone in an amount that could impact groundwater and does not migrate to surface water through discharges, including drainage, runoff, or sediment erosion.

   b) Some or all growers in the three categories listed below may have alternative nitrogen reporting requirements as specified. The alternative reporting requirements can be applied upon Executive Officer approval that the grower(s) meet the stated criteria.

      I. Growers that operate in areas with evidence of no or very limited nitrogen impacts to surface water or groundwater; have minimal nitrogen inputs; and have difficulty measuring yield, may report the A value only. The Executive Officer will determine when, if at all, these growers will begin reporting R.

      II. Diversified socially disadvantaged growers, as defined by the Farmer Equity Act of 2017, with a maximum total acreage of 45 acres; gross annual sales of less than $350,000; and a crop diversity greater than 0.5 crops per acre (one crop for every two acres), may initially report the A value only. The Executive Officer will determine when these growers will begin reporting R and whether these growers must receive targeted self-certification training. The third-party or the Member may propose alternative methodologies for estimating R to the Executive Officer for approval.

      III. Growers with a maximum total acreage of 20 acres and a crop diversity greater than 0.5 crops per acre (one crop for every two acres), may initially report the A value only. The Executive Officer will determine when these growers will begin reporting R. The third-party or the Member may propose alternative methodologies for estimating R to the Executive Officer for approval.

   The third-party may propose additional categories of growers and criteria to the Executive Officer for approval of alternative nitrogen reporting requirements. Alternative reporting requirements will be specified as part of the approval process.

E. Drinking Water Supply Well Monitoring

Due to the potential severity and urgency of health issues associated with drinking groundwater with high concentrations of nitrates, Members will be required to conduct testing and monitoring of all

2020, Members must submit to the third-party the NMP Summary Report for the previous year in accordance with Order R5-2014-0030-05.

[35] For the period 1 March 2015 through 1 March 2019, Members in low vulnerability groundwater areas must prepare a Nitrogen Management Plan (NMP) in accordance with Order R5-2014-0030-05.

drinking water supply wells present on enrolled parcels[36] in accordance with the schedule in Attachment B, MRP section IV.A. If a well is identified as exceeding the MCL for nitrate, the Member must notify the Central Valley Water Board and users of the well in a timely fashion in accordance with the elements described in Attachment B, MRP section IV.A.

F. Mitigation Monitoring

As specified in this Order, certain Members are required to implement the mitigation measures included in Attachment C. Such Members shall submit mitigation monitoring by 1 March of each year to the third-party. 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.

G. Management Practice Implementation Reporting in Surface and Groundwater Quality Management Areas

Commencing on 1 March 2021, Members in areas subject to a SQMP or GQMP shall complete a Management Practice Implementation Report (MPIR) and submit a copy of the completed MPIR to the third-party group. The frequency and schedule of the MPIR submittal shall be specified by the Third Party for each SQMP or GQMP and approved by the Executive Officer. The Member must use an MPIR form tailored to the requirement contained in each SQMP or GQMP and designed by the Third Party and approved by the Executive Officer. The MPIR shall report management practices implemented by the Member to comply with requirements under the SQMP or GQMP. The reporting frequency shall be based on the implementation cycle of the applicable management practices.

VIII. Required Reports and Notices – Third-Party

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 third-party. The third-party shall submit reports and notices in accordance with section IX, Reporting Provisions. Due dates for third-party required reports are summarized in Table 1 at the end of this Order. The third-party must prepare the following reports:

A. Application to Serve as a Third-Party Representing Members

Within 30 days of the effective date of this Order, any group wishing to serve as a third-party must submit a letter to the Executive Officer requesting to serve as a third-party representing Members to carry out the third-party responsibilities. The NOA issued by the Executive Officer will identify the third-party geographic boundaries if the third-party requests to serve as a third-party for a portion of this Order's coverage area. The Executive Officer will consider the following factors in determining whether to approve the request by issuing a Notice of Applicability (NOA) to the third-party.

1. Ability of the third-party to carry out the third-party responsibilities identified in this Order, whether the third-party has clearly identified the geographic area proposed to be covered by the third-party and should a third-party request to serve as a third-party for only a portion of this Order's coverage area, the reasonableness of the proposed boundaries.

[36] Where a portion of the parcel is leased to a party other than the Member and the terms of the lease give the Member no control over the drinking water supply wells on that parcel, the owner of the parcel is responsible for the sampling of those drinking water supply wells.

2. Whether the third-party is a legally defined entity (i.e., non-profit corporation; local or state government; Joint Powers Authority) or has a binding agreement among multiple entities that clearly describes the mechanisms in place to ensure accountability to its Members.

3. Whether the third-party has binding agreements with any subsidiary group (e.g., subwatershed group) to ensure any third-party responsibilities carried out by the subsidiary group, including the collection of fees, are done so transparently and with accountability to the third-party and its Members. If the third-party will not rely on any subsidiary group to carry out any of its responsibilities, the third-party must state that in its application letter.

4. Whether the third-party has a governance structure that includes a governing board of directors composed in whole or in part of Members, or otherwise provides Members with a mechanism to direct or influence the governance of the third-party through appropriate by-laws.

5. Should the Central Valley Water Board terminate an organization's role as a third-party or should the third-party submit a notice of termination, the Executive Officer will apply the above factors in evaluating the request of any successor organization to serve as a third-party and determining whether to approve the request by issuing an NOA.

6. A new third party may form to represent growers in an existing third party area, or part of that area, after a NOA has been issued to the existing third-party. The Executive Officer will consider the factors in VIII.A.1-4 above in determining whether to approve the request by issuing an NOA to the new third-party. Prior to acting on the NOA, the Executive Officer will provide the existing third-party with an opportunity to comment on the application by the new third-party group. The new third-party and its Members must take all actions and submit subsequent reports required by the Order on the timeline originally established by the issuance of the NOA to the original third-party group for the area. The proposed new third party must demonstrate that it can comply with the original time schedule as part of its application to serve as a third-party representing Members. Any required report not submitted by the existing third-party, and due prior to application of the new third-party, must be submitted as part of the application package of the new third-party.

B. Membership (Participant) List

The third-party shall submit a list of its Members to the Central Valley Water Board annually by 31 July of each year. The membership list shall identify Members. The list shall also identify growers that have had their membership revoked and Members that are pending revocation. The membership list shall contain, at a minimum, the following information for each member: all parcel numbers covered under the membership, the county of each parcel, the section, township, and range associated with each parcel, the number of irrigated acres[37] for each parcel, the Member's name, mailing address, the contact name and phone number of the individuals authorized to provide access to the enrolled parcels, and the name of the farm operator for each parcel, if different from the Member. In lieu of providing Members' phone numbers as part of the membership list, the third-party may provide the office contact name(s) and phone number(s) of a representative of the third-party who will provide the information to the Central Valley Water Board upon request. Any listed third-party office contact must be available for Central Valley Water Board staff to contact Monday through Friday (except established state holidays) from 8 am to 5 pm.

C. Templates

The Executive Officer will provide templates to the third-party to distribute to its Members. The templates must be used to comply with the requirements of this Order, where applicable. Prior to

[37] In the case of seasonal or permanent wetlands, irrigated acres do not include non-irrigated upland habitat areas.

providing the third-party with the templates, the Executive Officer will provide the third-party and other interested parties with thirty (30) days to comment on proposed templates. The following templates will be provided: Farm Evaluation, Irrigation and Nitrogen Management Plan, Irrigation and Nitrogen Management Plan Summary Report, Sediment and Erosion Control Plan; Drinking Water Notification.

The templates must be used by Members to comply with the requirements of this Order, with the exception of managed wetlands if a template specific to managed wetlands is approved by the Executive Officer. The third-party may submit a written request to the Executive Officer, for approval of a Managed Wetland Evaluation Template within 60 days of issuance of an NOA to the third-party. The Managed Wetland Evaluation Template must include an evaluation of management practices associated with managed wetlands that could affect the quality of surface water or groundwater.

D. Annual Report on Management Practice Implementation and Nitrogen Application

The third-party shall submit an Annual Report to the Executive Officer with data on management practice implementation and nitrogen application as specified in Attachment B MRP sections V.C and V.D.

E. Groundwater Quality Monitoring and Protection

This Order's strategy for evaluating groundwater quality and protection consists of (1) Drinking Water Supply Well Monitoring, (2) a Groundwater Quality Assessment Report, (3) a Management Practices Evaluation Program, and (4) a Groundwater Quality Trend Monitoring Program, and (5) Groundwater Quality Management Plans that include Groundwater Protection Targets. Elements 1-4 have their own specific objectives briefly described below, with more detail provided in the attached MRP. Element 5 is briefly described in section VIII.J. and is further detailed in the attached MRP.

1. Drinking Water Supply Well Monitoring

Members shall conduct testing and monitoring of all drinking water supply wells present on enrolled parcels in accordance with Attachment B MRP section IV.A. The third-party, on behalf of Members, may conduct testing and monitoring of all drinking water supply wells present on enrolled parcels. If a well is identified as exceeding the MCL for nitrate, the Member must notify the Central Valley Water Board and users of the well in a timely fashion in accordance with the elements described in Attachment B MRP section IV.A.

2. *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. To accomplish this purpose, the GAR must include 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,
- Establish priorities for implementation of monitoring and associated studies within high vulnerability areas;
- Provide a basis for establishing workplans to assess groundwater quality trends;
- Provide a basis for establishing workplans and priorities to evaluate the effectiveness of agricultural management practices to protect groundwater quality; and

- Provide a basis for establishing groundwater quality management plans in high vulnerability areas and priorities for implementation of those plans.

The GAR shall include the elements described in Attachment B MRP section IV. The GAR shall be submitted to the Central Valley Water Board and Central Valley Salinity Coalition within one (1) year of receiving an NOA from the Executive Officer.

3. Management Practice Evaluation Program Workplan

Upon Executive Officer approval of the GAR, the third-party shall develop, either solely, or as a coordinated effort (see group option below), a Management Practice Evaluation Program (MPEP) Workplan. The workplan must meet the goals, objectives, and other requirements described in Attachment B MRP section IV.C. The MPEP shall prioritize the determination of the crop-specific coefficients for conversion of yield to nitrogen removed followed by the determination of acceptable ranges for the multi-year A/R ratios target values by crop. In addition, the overall goal of the Management Practice Evaluation Program is to evaluate the effectiveness of management practices in limiting the discharge of waste from irrigated lands to groundwater under different conditions (e.g., soil type, depth to groundwater, irrigation practice, crop type, nutrient management practice). A MPEP may prioritize the conditions relevant to high vulnerability groundwater areas. The third-party may develop the workplan in accordance with one of the options described below.

a. Management Practices Evaluation Program Group Option

The third-party may fulfill its requirements as part of a Management Practices Evaluation Program Group. A Management Practices Evaluation Program (MPEP) Group refers to an entity that is formed to develop and carry out the management practices effectiveness evaluations required of this and other Orders applicable to the irrigated lands in the Central Valley.

At the time the GAR is submitted, the third-party must submit a copy of the agreement of the parties included in the MPEP Group. The agreement must include a description of the roles and responsibilities of each of the organizations in the MPEP Group; identification of the technical experts who will prepare and implement the workplans, along with their qualifications; the person(s) responsible for the timely completion of the workplans and reports required by this Order; and an organizational chart showing the reporting relationships and responsibilities of the participants in the group.

The MPEP Group Workplan shall be submitted to the Central Valley Water Board within one (1) year after written approval of the GAR by the Executive Officer. Alternatively, the third-party may indicate, as part of its GAR submittal, that the third-party is participating in an MPEP Group whose Workplan will be submitted in accordance with the time frame of another Order applicable to irrigated lands in the Central Valley.

The third-party may use the group option if approved by the Executive Officer. The Executive Officer may disapprove the use of the group option, if 1) the group fails to meet required deadlines or implement the approved workplans; 2) the agreement submitted is not complete; or 3) the agreement submitted is deficient.

b. Third-party Only Management Practices Evaluation Program

Under this option, the third-party MPEP Workplans shall be submitted to the Central Valley Water Board within one (1) year after written approval of the GAR by the Executive Officer.

4. Groundwater Quality Trend Monitoring Workplan

Upon Executive Officer approval of the GAR, the third-party shall develop a Groundwater Quality Trend Monitoring Workplan. The workplan must meet the goals, objectives, and other requirements described in Attachment B MRP section IV. The overall objectives of groundwater trend monitoring are to determine current water quality conditions of groundwater relevant to irrigated agriculture and develop long-term groundwater quality information that can be used to evaluate the regional effects of irrigated agricultural practices. The workplan shall be submitted to the Central Valley Water Board within one (1) year after written approval of the GAR by the Executive Officer.

F. Sediment Discharge and Erosion Assessment Report

The Sediment Discharge and Erosion Assessment Report shall be submitted to the Central Valley Water Board within one (1) year of receiving an NOA from the Executive Officer. Within 30 days of written acceptance of the Sediment Discharge and Erosion Assessment Report, the third-party shall inform those Members with parcels in areas identified in the report of their obligation to prepare a Sediment and Erosion Control Plan. The Sediment Discharge and Erosion Assessment Report shall include the elements described in Attachment B MRP section VI.

G. Watershed/Subwatershed Based Sediment and Erosion Control Plans

Per section VII.C.2, the third-party may assist Members to fulfill sediment and erosion control requirements through development and implementation of a watershed or subwatershed based Sediment and Erosion Control Plan that includes collective management practices. A collective Sediment and Erosion Control Plan, once approved by the Executive Officer, shall be considered to constitute an approved Surface Water Quality Management Plan (SQMP) for sediment for the area covered by the plan. The following requirements and deadlines shall apply:

- Within 90 days of the Executive Officer accepting the third party's Sediment Discharge Erosion Assessment Report, the third-party must submit a list of the individual member participants for each watershed/subwatershed based (or collective) plan to the Executive Officer.

- Within 270 days of the Executive Officer accepting the third party's Sediment Discharge and Erosion Assessment Report, the third party shall submit to the Executive Officer of the Regional Board any watershed/subwatershed (or collective) based Sediment and Erosion Control Plans that have been developed to comply with these provisions, including requirements in the MRP, section VII.

- The watershed/subwatershed (or collective) Sediment and Erosion Control Plan must be prepared according to the requirements listed in section VII.C.1, items c or d of this Order.

- The watershed/subwatershed (or collective) Sediment and Erosion Control Plan, including its implementation schedule, shall be approved by the Executive Officer.

H. Surface Water Exceedance Reports

The third-party 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 Attachment B MRP section V.F.

I. Monitoring Report

The third-party shall submit the Monitoring Report to the Central Valley Water Board in accordance with the requirements in Attachment B MRP section V.E.

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

1. SQMP/GQMP General Requirements

SQMP/GQMPs submitted by the third-party 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 third-party 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 the third-party does not allow the Central Valley Water Board to determine the effectiveness of the management plan. Members shall comply with the revised management plans once they are approved by the Executive Officer. SQMPs triggered by data gathered under Conditional Waiver Order R5-2006-0053 that were not completed or approved by the Executive Officer prior to adoption of this Order shall be implemented in accordance with MRP-1 of this Order.

For newly triggered SQMP/GQMPs, the third-party shall submit a SQMP/GQMP to the Central Valley Water Board within ninety (90) 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 90-day period begins the first business day after the third party'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 third-party may, at its discretion, implement outreach or monitoring contained in a proposed management plan before approval.

The third-party shall ensure continued implementation of SQMP/GQMPs until approved as completed by the Executive Officer pursuant to the provisions contained in Attachment B MRP, Appendix MRP-1, section III. The third-party shall submit a progress report in compliance with the provisions contained in Attachment B MRP, Appendix MRP-1, section I.F.

2. Conditions Requiring Preparation of SQMP/GQMP

a. *Surface Water Quality Management Plan (SQMP)*

A SQMP shall be developed by the third-party where: (1) an applicable water quality objective or applicable water quality trigger limit is exceeded (considering applicable averaging periods[38]) twice in a three year period for the same constituent at a monitoring location (trigger limits are described in section VIII of the MRP) and irrigated agriculture may cause or contribute to the exceedances; (2) the Basin Plan or Bay-Delta Plan require 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

[38] Exceedances of water quality objectives or water quality triggers will be determined based on any available data, including data from a regional monitoring program, 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 will use the best available information to determine an appropriate averaging period.

degradation of surface water that may threaten applicable Basin Plan or Bay-Delta Plan beneficial uses.

b. Groundwater Quality Management Plan (GQMP)

A GQMP shall be developed by the third-party where: (1) there is a confirmed exceedance[39] (considering applicable averaging periods) of a water quality objective or applicable water quality trigger limit (trigger limits are described in section VIII of the MRP) in a groundwater well and irrigated agriculture may cause or contribute to the exceedance; (2) in high vulnerability groundwater areas to be determined as part of the Groundwater Assessment Report process (see MRP section IV); (3) the Basin Plan requires development of a groundwater quality management plan for a constituent or constituents discharged by irrigated agriculture; or (4) the Executive Officer, upon consideration of State Water Board Hydrogeologically Vulnerable Areas and the Department of Pesticides Regulation Groundwater Protection Areas and other relevant information, determines that irrigated agriculture may be causing or contributing to exceedances of water quality objectives or a trend of degradation of groundwater that may threaten applicable Basin Plan beneficial uses.

If the extent of Member contribution to a water quality exceedance(s) or degradation trend is unknown, the third-party may propose activities to be conducted to determine the cause or eliminate irrigated agriculture as a potential source instead of initiating a management plan. Requirements for source identification studies are set forth in Attachment B MRP, Appendix MRP-1, section I.G.

***3.* SQMP/GQMP Not Required**

At the request of the third-party or upon recommendation by Central Valley Water Board staff, the Executive Officer may determine that the development of a SQMP/GQMP is not required. Such a determination may be issued if there is sufficient evidence indicating that Members 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 irrigated agriculture does not cause or contribute to the water quality problem).

4. Comprehensive Groundwater Quality Management Plan

In lieu of submitting separate groundwater quality management plans in the timeframe identified in section VIII.J.1, the third-party may submit a Comprehensive Groundwater Quality Management Plan within 60 days of the Executive Officer's approval of the Groundwater Quality Assessment Report. With the exception of the timeframe identified in section VIII.J.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 Attachment B MRP, Appendix MRP-1, section I.F) 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

In lieu of submitting separate surface water quality management plans in the timeframe identified in section VIII.J.1, the third-party may submit a Comprehensive Surface Water Quality

[39] 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. The determination of an exceedances may be based on data obtained by the Regional Water Board from any source and made available in GeoTracker, including pesticide-related monitoring data collected by the Department of Pesticide Regulation.

Management Plan or update the Surface Water Quality Management Plan approved under the Coalition Group Conditional Waiver to conform to this Order and MRP. With the exception of the timeframe identified in section VIII.J.1, all other provisions applicable to surface water quality management plans in this Order and Attachment B MRP apply to the Comprehensive Surface Water Quality Management Plan or an updated Surface Water Quality Management Plan approved under the Coalition Group Conditional Waiver. The Comprehensive Surface Water Quality Management Plan must be updated at the same time as the Management Plan Status Report (see Attachment B MRP, 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.

K. Technical Reports

Where monitoring required by this Order is not effective in allowing the board to determine the effects of irrigated agricultural 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 irrigated agricultural operations or implemented management practices on surface water or groundwater quality.

L. Notice of Termination

If the third-party 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 third-party shall submit a notice of termination letter to the Central Valley Water Board and all of its Members. Termination of the third-party will occur 30-days from submittal of the notice of termination letter, unless otherwise specified in the letter. With its notice of termination sent to its Members, the third-party shall inform its Members of their obligation to obtain coverage under other WDRs or a waiver of WDRs for their discharges or inform such Members that they shall cease all discharges of waste to surface water and groundwater.

M. Total Maximum Daily Load (TMDL) Requirements

Approved TMDLs in the Basin Plan that apply to water bodies within the third-party's geographic area and have allocations for irrigated agriculture shall be implemented in accordance with the applicable Basin Plan provisions. Where required, the third-party 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.

N. Basin Plan Amendment Workplan

In its Groundwater Quality Assessment Report, the third-party may identify high vulnerability areas that do not meet water quality objectives and where groundwater quality likely would not support a designated beneficial use even in the absence of the discharge of waste. In such cases, the third-party has the option of pursuing a basin plan amendment (or identifying an existing basin plan amendment process) to address the appropriateness of the beneficial use. Should the third-party pursue this option, the third-party shall submit a Basin Plan Amendment Workplan (BPAW) to the Central Valley Water Board within 120 days of the approval of the Groundwater Quality Assessment Report. The BPAW must include a demonstration that the groundwater proposed for de-designation meets any criteria set forth in the Basin Plan that the Board considers in making exceptions to beneficial use designations. The BPAW must be prepared in accordance with the requirements in section V.G of the MRP.

IX. Reporting Provisions

1. Members and the third-party must submit required reports and notices in accordance with the requirements in this Order and attached Monitoring and Reporting Program Order R5-2014-0030-06, 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 Members 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 third-party or a Member of the third-party 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 un-redacted pages (to be maintained separately by staff). The Member/third-party 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 Member/third-party 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. NOIs shall generally not be considered exempt from disclosure.

5. To the extent feasible, when the Executive Officer directs a Member to submit a report directly to the board, the report shall be submitted electronically to irrlands@waterboards.ca.gov, unless the Member 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 third-party 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 Member and the third-party shall maintain any reports or records required by this Order for ten years. Records maintained by the third-party include reports and plans submitted by Members to the third-party for purposes of complying with this Order. Individual Member information used by the

third-party to prepare required reports must be maintained electronically and associated with the Member 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 ten years from the date of sample, measurement, report, or application. This ten-year period shall be extended during the course of any unresolved litigation regarding the discharge or when requested in writing by the Executive Officer.

The Third Party shall propose a mechanism for backing up and storing the field-specific data submitted on the Farm Evaluations, the INMP Summary Reports, and the MPIRs in a secure offsite location managed by independent entity that specializes in the protection of data. Upon approval of the mechanism by the Executive Officer, the Third Party shall implement the mechanism and provide documentation of the transfer of data to the independent entity.

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. Members 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 third-party is responsible for collecting these fees from Members and submitting them to the State Water Board on behalf of Members.

XII. Time Schedule for Compliance

When a SQMP or GQMP is required pursuant to the provisions in section VIII.J, the following time schedules shall apply as appropriate in order to allow Members sufficient time to achieve compliance with the surface water and groundwater receiving water limitations described in section III 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 the 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 12 March 2014 and remains in effect as revised on 5 June 2015, 2 October 2015, 19 February 2016, and 7 February 2019 unless rescinded or revised by the Central Valley Water Board.

I, PATRICK PULUPA, 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 12 March 2014 and revised on 5 June 2015, 2 October 2015, 19 February 2016, and 7 February 2019.

Original signed by

PATRICK PULUPA, Executive Officer

Table 1. Summary of third-party deliverables, required timelines, and approximate due date based on the anticipated adoption of the Waste Discharge Requirements for growers within the Sacramento River Watershed on 11 March 2014.

Third-party Requirements		Relative Date	Approximate Due Date
Notice of Intent		30 days after adoption of WDR's	11-Apr-2014
	EO will issue Notice of Applicability (NOA) to the third-party		
Provide notice of requirements and process for Notice of Confirmation to members		45 days after NOA	30-May-2014
Template comments due		30 days after EO provides templates	TBD
Groundwater Quality Assessment Report (GAR) outline		90 days after NOA	14-Jul-2014
Comprehensive Groundwater Quality Management Plan		60 days after GAR Approval	TBD
Groundwater Quality Assessment Report (GAR)		1 year after NOA	14-Apr-2015
Sediment Discharge and Erosion Assessment Report		1 year after NOA	14-Apr-2015
	EO will review Groundwater Assessment Report (GAR) and Sediment Assessment Report		
Inform members required to prepare Sediment Plans		30 days from Sediment Report approval	14-July-2015
Groundwater Trend Monitoring Workplan		1 year from GAR approval	15-July-2016
Groundwater QAPP		1 year from GAR approval	15-July-2016
Management Practices Evaluation Program (MPEP) Group Agreement		1 year after NOA	15-Apr-2015
Management Practices Evaluation Program (MPEP) Group Workplan		1 year from GAR approval	15-July-2016
Management Practices Evaluation Report (MPER)		6 years after MPEP implementation	July-2022
Monitoring Plan Update		each year	1-August
Annual Report -- Monitoring Results, Management Plan Progress, etc.		each year	1-May
Membership List		each year	31-July
Collective Sediment Plans	Submit a list of individual member participants	90 days from Sediment Report approval	15-Sept-2015
	Submit Collective Sediment and Erosion Control Plans	270 days from Sediment Report approval	15-Mar-2016

Table 2. Summary of third-party member deliverables, required timelines, and approximate due date based on the anticipated adoption of the Waste Discharge Requirements for growers within the Sacramento River Watershed on 11 March 2014 and revisions by the Central Valley Water Board on 7 February 2019.

Grower Requirements		Relative Date	Approximate Due Date
Enrollment	Non-members (sign up)	120 days after NOA	15-Aug-2014
	Members (complete Notice of Confirmation)		30-Jun-2015
Farm Evaluations	Low Vulnerability Areas	1-Mar-2015, updated every 5 years starting on 1-Mar-2021	1-Mar-2015
	High Vulnerability Areas	1-Mar-2015, updated every 5 years starting on 1-Mar-2021	1-Mar-2015
Irrigation and Nitrogen Management Plan	High Vulnerability Areas	1-Mar-2015 and annually thereafter	1-Mar-2015
	Low Vulnerability Areas	1-Mar-2015 and annually thereafter	1-Mar-2015
INMP Summary Report	High Vulnerability Areas	1-Mar-2017 and annually thereafter	1-Mar-2017
	Low Vulnerability Areas	1-Mar-2021 and annually thereafter	1-Mar-2021
Individual Sediment Plans	High Vulnerability Areas	180 days from Sediment Report approval	15-Dec-2015
	Low Vulnerability Areas	not required	-
Collective Sediment Plans	Notify third-party of intent to participate	60 days Sediment Report Approval	15-Aug-2015

Figure 1. Map of the Sacramento River Watershed Area.

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
CENTRAL VALLEY REGION

Attachment A to Order R5-2014-0030-06
INFORMATION SHEET

WASTE DISCHARGE REQUIREMENTS GENERAL ORDER
FOR
GROWERS WITHIN THE SACRAMENTO RIVER WATERSHED
THAT ARE MEMBERS OF A THIRD-PARTY GROUP

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I. Overview

This attachment to Waste Discharge Requirements General Order for Growers within the Sacramento River Watershed that are Members of a Third-Party group, Order R5-2014-0030-06 (referred to as the "Order") is intended to provide information regarding the rationale for the Order, general information on surface and groundwater monitoring that has been conducted, and a discussion of this Order's elements that meet required state policy.

II. Introduction

There are numerous irrigated agricultural operations within the boundaries of the Central Valley Regional Water Quality Control Board (Central Valley Water Board) on over 7 million acres. Common to all types of these operations is the use of water to sustain crops. Depending on irrigation method, water use, geography, geology, climate, and the constituents (e.g., nutrients, pesticides, pathogens) present or used at a site, water discharged from the site may carry these constituents as waste off site and into groundwater or surface waters.

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 (WDRs) 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 (California Water Code (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 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 Report[2] for consideration by the board. The PEIR analyzed the

[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.

range of proposed alternatives developed by the Workgroup. The Draft PEIR was released in July 2010, 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 a third-party group general order for the Tulare Lake Basin in September 2013.

The geographic/commodity-based orders will allow for tailoring of implementation requirements based on the specific conditions within each geographic area. At the same time, 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. The Order includes provisions to reduce the reporting requirements for small farming operations and areas of low vulnerability.

A. Goals and Objectives of the Irrigated Lands Regulatory Program

The goals and objectives of this Order, which implements the long term ILRP in the Sacramento River Watershed, 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.*
> - *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*

[2] ICF International. 2010. Draft Technical Memorandum Concerning the Economic Analysis of the Irrigated Lands Regulatory Program (Economics Report).
[3] PEIR, page 2-6

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, County Agricultural Commissioners [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.

If an operation believes it is not subject to the requirements of the Order, it may submit a report to the Central Valley Water Board describing the waste discharge (e.g., whether there is a potential to affect groundwater quality). Upon review of the report, the Central Valley Water Board may choose to waive the requirement to obtain WDRs, issue individual WDRs specific to the operation, or seek to enroll the operation under the Order.

III. Generalized Description of the Sacramento River Watershed Area

The Sacramento River Watershed covers 27,210 square miles and generally includes the area drained by the Sacramento River. This includes all watersheds tributary to the Sacramento River that are north of and including the Cosumnes River watershed. It also includes the closed basin of Goose Lake and drainage sub-basins of Cache and Putah Creeks. The principal streams are the Sacramento River and its larger tributaries: the Pit, Feather, Yuba, Bear, and American Rivers to the east; and Cottonwood, Stony, Cache, and Putah Creeks to the west. Major reservoirs and lakes include Shasta, Oroville, Folsom, Clear Lake, and Lake Berryessa. The Watershed area includes portions of Amador, El Dorado, Glenn, Lake, Lassen, Modoc, Napa, Nevada, Placer, Shasta, Sierra and Solano Counties, as well as the entire counties of Butte, Colusa, Plumas, Sacramento, Sutter, Tehama, Yolo and Yuba. See Figure 1 of the Order for a map of the area. There are approximately 2.36 million acres of irrigated agricultural land within the watershed area, although approximately 27,000 of these acres are regulated under the Central Valley Water Board's General Order for Existing Milk Cow Dairies, while approximately 540,510 acres are regulated under the Coalition Group Conditional Waiver through the California Rice Commission.

See Table 1 below for more detailed acreage information. In addition, there are as many as 102,000 acres of managed wetlands in the watershed.

The Sacramento River is the largest river in California, with an average annual runoff of about 22.4 million acre-feet, ultimately draining south to the Sacramento-San Joaquin Delta. The average annual precipitation for the entire Sacramento River Basin is 36 inches, most of which falls as rain or snow during November through March. Because little or no rain falls during the summer growing season, irrigation is required for successful agriculture. Precipitation amounts in northern California are variable and dependent on the location of the Pacific jet stream. The average annual rainfall at the city of Sacramento is about 18 inches. Most major streams contain perennial flows, while many smaller tributaries may become partly or entirely dry during summer and fall. In many cases, summertime flows are entirely dependent on agricultural flows.

Table 1. Approximate distribution of crop acreage within the subwatershed areas of the Sacramento River Watershed.

Subwatershed	Total Irrigated acres*	Field Crop Acres	Hay and Irrigated Pasture Acres	Orchard and Vine Crop Acres	Vegetable and Seed Crop Acres
Butte-Sutter-Yuba	313,419	57,634	49,029	170,511	36,245
Colusa-Glenn	290,756	75,220	36,601	119,998	58,937
El Dorado	4,779		1,147	3,632	
Lake	16,672		3,063	13,609	
Napa	5,367			5,367	
Pit River**	86,545	-	17,135	-	-
Placer/Nevada/S. Sutter/N. Sacramento	40,590	2,677	28,536	2,006	-
Sacramento Amador	153,063	65,981	38,378	39,796	8,908
Shasta-Tehama	141,684	4,228	87,183	44,564	484
Solano	154,810	51,821	62,553	18,288	22,148
Upper Feather River	60,000	-	60,000	-	-
Yolo	337,026	153,100	63,965	41,839	78,122
Goose Lake	7,314		7,314		

*Excluding commercial rice (*Oryza sativa*), wild rice is included

**Crop breakdown for Modoc County not available

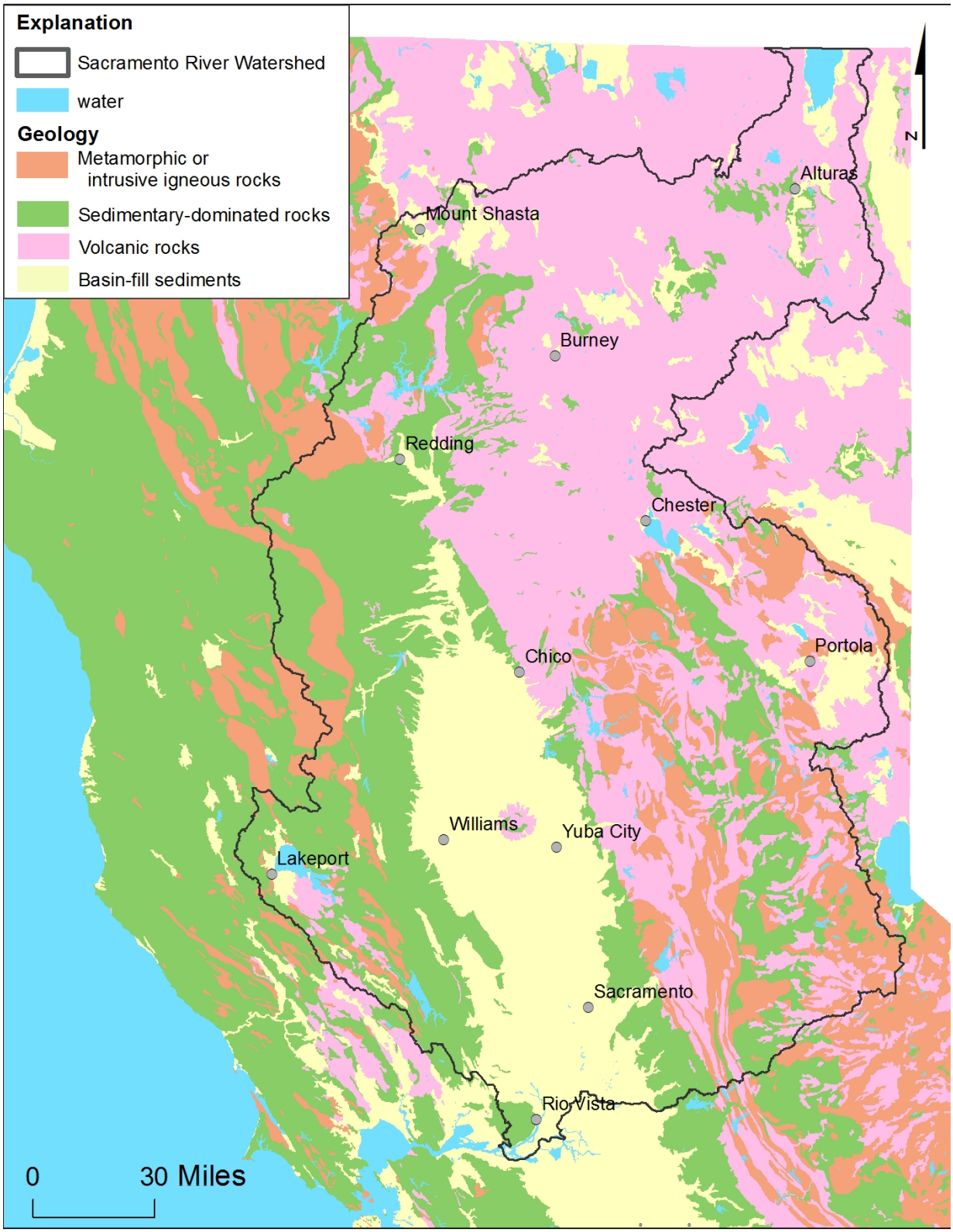
All data is from the respective 2011 County Crop Reports, acres for counties partially included in the watershed are estimated.

The Sacramento River watershed supports a diverse agricultural economy, much of which depends on the availability of irrigation water. Water is collected in reservoirs at many locations within the Sacramento River watershed and is released according to allocations for agricultural, urban, and environmental needs. The reservoirs also serve as management tools, providing for flood protection as well as storage of water which can be released during dry years. Major crops produced within the watershed include rice, fruits, tree nuts, corn, grains, and alfalfa. Livestock and dairy products are also important agricultural commodities.

Groundwater Resources

The Sacramento River watershed area includes all or parts of six geomorphic provinces—the Great Valley, Modoc Plateau, the Cascade Range, the Sierra Nevada, the Klamath Mountains and the Coast Ranges. The Sacramento Valley, part of the Great Valley, is a large sediment-filled trough (Figure 1, Thiros 2010). Irrigated agriculture is located in all of these areas, each with a characteristic mix of crops. For purposes of this Order, important groundwater resources exist in the Sacramento Valley, Sierra Nevada, Modoc Plateau, and Coast Ranges provinces. These are described below.

Figure 1. Generalized geology of the Sacramento River watershed. (Adapted from Thiros, 2010.) [4]



[4] Thiros, S.A., 2010. Section 13. Conceptual Understanding and Groundwater Quality of the Basin-Fill Aquifer in the Central Valley, California *in* Conceptual Understanding and Groundwater Quality of Selected Basin-Fill Aquifers in the Southwestern United States. United States Geological Survey Professional Paper 1781.

Sacramento Valley[5]

Sediments containing fresh groundwater in the Sacramento Valley are derived from the surrounding mountain ranges and constitute a mix of marine, continental, and volcanic sediments. Marine sediments are derived from the Coast Ranges, whereas the continental and volcanic sediments are derived from the Sierra Nevada and Cascade Ranges. Sediments that have filled the Sacramento Valley may be as much as 10 miles thick. Fresh groundwater typically occurs in Pliocene- to Holocene-age sediments that overlie saline-water-saturated sediments at depth. The base of freshwater [water with a specific conductance less than 3,000 µS/cm, or about 2,000 mg/L, total dissolved solids] in the Sacramento Valley generally occurs at less than 2,500 ft below land surface. Important groundwater basins include the Redding groundwater basin and the Sacramento Valley groundwater basin.

Sierra Nevada[6]

Groundwater is used extensively for municipal, community, and domestic drinking-water supplies in the Sierra Nevada. Because fractured rock systems are the primary aquifer types in the province, 97 percent of the province area is not part of Department of Water Resources-defined groundwater basins. Granitic and metamorphic rocks of the Sierra Nevada have low permeability except where fractured. Fractures and joints generally are more extensive in size and number in the upper few hundred feet of bedrock and typically decrease with depth. The three-dimensional complexity and variability of fracture systems can cause well yields and water quality to vary widely on a local scale.

Although groundwater basins comprise a small part of the province area, they generally have a high density of groundwater use because they often contain population centers and have wells with much greater yields than those in the surrounding fractured rock aquifers. The basins are small and composed of fluvial, alluvial, or glacial sediments.

Modoc Plateau[7]

The Modoc Plateau province consists of volcanic rocks, primarily basalt and basaltic andesite lava flows. Fault-bounded basins within the Modoc Plateau are filled with alluvial, pyroclastic, and lacustrine sediments. Groundwater in volcanic rocks is primarily contained in fractures, tuff beds, rubble zones at the tops of lava flows, volcanic pipes, and interbedded sand layers. The distribution of permeable zones is unpredictable, although the probability of large groundwater yields generally is greater in areas near fault zones. The younger volcanic rocks generally are more permeable because secondary mineralization from hydrothermal alteration tends to lower permeability in older volcanic rocks. Because the volcanic groundwater units are highly permeable and have little soil or sediment on top of them, surface streams and groundwater interchange easily: streams disappear into the ground and reappear as spring discharge downstream.

Coastal Ranges[8]

The primary aquifers in the Coastal Range area occur in Quaternary-alluvium groundwater basins made up of sand, silt, gravel, and clay eroded from the surrounding hills. These deposits interfinger with and grade into alluvial fan and terrace deposits along the sides of the valleys, and older more consolidated alluvium at depth, and in some valleys, finer-grained lake deposits towards the center of the basins.

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[5] This section is adapted from: Bennett, G.L., V, Fram, M.S., and Belitz, Kenneth, 2011, Status of groundwater quality in the Southern, Middle, and Northern Sacramento Valley study units, 2005–08—California GAMA Priority Basin Project: U.S. Geological Survey Scientific Investigations Report 2011–5002, 120 p.

[6] This section is adapted from: Shelton, J.L., Fram, M.S., Munday, C.M., and Belitz, Kenneth, 2010, Groundwater-quality data for the Sierra Nevada study unit, 2008: Results from the California GAMA program: U.S. Geological Survey Data Series 534, 106 p.

[7] Shelton, J.L., Fram, M.S., and Belitz, Kenneth, 2013, Groundwater-quality data in the Cascade Range and Modoc Plateau study unit, 2010—Results from the California GAMA Program: U.S. Geological Survey Data Series 688, 124 p.

[8] Mathany, T.M., Dawson, B.J., Shelton, J.L., and Belitz, Kenneth, 2011, Groundwater-quality data in the northern Coast Ranges study unit, 2009: Results from the California GAMA Program: U.S. Geological Survey Data-Series 609, 92 p.

Groundwater conditions are mostly unconfined, with some confined areas toward the center of valleys and at depth. In groundwater basins near Clear Lake, the major rock type is Quaternary volcanic rock associated with the Clear Lake or Sonoma Volcanic. In the Big Valley basin adjacent to Clear Lake, groundwater also is supplied by thin volcanic ash layers/lenses interbedded with low permeability sediments. Groundwater recharge in this area occurs from a mixture of ambient recharge (direct percolation of precipitation and irrigation waters, infiltration of run-off from surrounding hills, and seepage from rivers and creeks).

Sacramento Valley Water Quality Coalition (SVWQC) Subwatershed Descriptions[9]

The SVWQC facilitates grower outreach, communication and participation through subwatershed organizations. The subwatershed areas are described below. The subwatershed designations were based on hydrology, crop types, cropping intensity, land use, soil types, rainfall and county lines (see Figure 2).

Butte/Yuba/Sutter Subwatershed. The Butte-Yuba-Sutter subwatershed encompasses all of Butte and Yuba counties and most of Sutter County. The primary land uses include agriculture and grazing with significant crops including orchards (almonds, walnuts, peaches, prunes, and olives), row crops (beans and tomatoes), rice, alfalfa, and pasture. Major waterways include the Yuba, Lower Feather, Bear and the Sacramento rivers. There are over 35 named drainages in this subwatershed, including Sacramento Slough, Sutter Bypass, Pine Creek, Lower Snake River, Cherokee Canal, Honcut Creek, Jack Slough, and Dry Creek. Major population areas include Oroville, Chico, Marysville and Yuba City. The lead agencies for this subwatershed are the Sutter Resource Conservation District (grower outreach and reporting) and the Yuba-Sutter Farm Bureau.

Colusa Glenn Subwatershed. The Colusa Glenn Subwatershed encompasses all of Colusa and Glenn counties. The primary land use is agriculture, with significant crops including rice, almonds, prunes, walnuts, wheat, pasture alfalfa/hay, corn, and row crops (tomatoes, melons, squash, beets and cucumbers). Important drainages include the Colusa Basin Drain, Walker Creek, Stony Creek, Lurline Creek, Freshwater Creek and the Sacramento River. Major population areas include Williams, Colusa, Willows, and Orland. The Colusa Glenn Subwatershed Program is managed by the Glenn County Resource Conservation District in cooperation with the Colusa Resource Conservation District.

El Dorado Subwatershed. The El Dorado Subwatershed is located within El Dorado County. Approximately half of the watershed is designated as National Forest, which includes timber harvest activities. Agricultural use occurs on a little more than 5,000 acres, with the majority of acreage planted in wine grapes. Apples are the second largest crop after wine grapes, followed by pears, walnuts, cherries, peaches and plums. In addition, approximately 500 acres are planted in conifer trees that are sold during the holidays. Important drainages include the South Fork American River and the North and Middle Forks of the Cosumnes River. The main population centers are Placerville and Camino. The El Dorado County Agricultural Water Quality Management Corporation leads the subwatershed program.

Lake Subwatershed. This subwatershed is comprised of the greater part of Lake County. Major land uses include pasture, rangeland, vineyards. The primary irrigated agricultural crops are wine grapes, walnuts and pears. Important drainages include Upper Cache Creek, Middle Creek, Scotts Creek and Kelsey Creek. The main population areas include Clear Lake, Lower Lake, Kelseyville, Lakeport, Nice, Lucerne, Clearlake Oaks and Middletown. The subwatershed program is managed by the Lake County Farm Bureau.

Napa Subwatershed. The Napa Subwatershed encompasses a small eastern portion of Napa county. The major land uses include pasture, rangeland, vineyards and orchards. The primary agricultural crops

[9] Information for the Subwatershed descriptions is adapted from Sacramento Valley Water Quality Coalition 2008 Monitoring and Reporting Plan, and Attachment C of the Monitoring and Reporting Program Order No. R5-2009-0875 for the Sacramento Valley Water Quality Coalition.

include cattle, wine grapes and olives. Important drainages include Capell Creek, Pope Creek, and Upper Putah Creek. There are no significant population centers in this subwatershed. The subwatershed program is managed by the Napa County Resource Conservation District.

Pit River Subwatershed. The Pit River Subwatershed is located primarily in Modoc County with additional acreage in Lassen and Shasta counties. Elevation differences in this watershed are dramatic, with the Warner Mountains at 9,800 feet and the Fall River Valley at 3,200 feet. Major land uses include grazing and timber harvest. Common crops produced in the Pit River Subwatershed include: alfalfa hay, alfalfa/orchard grass hay, timothy hay, assorted grass hay, oats, barley, wheat, potatoes, irrigated pasture, strawberries, nursery plants, wild rice, peppermint, garlic, onions, and various vegetable seeds. Important drainages include the Fall River and the North and South Forks of the Pit River. The main population centers include Burney, Fall River Mills, and Alturas. The Northeastern California Water Association manages this subwatershed program.

Placer/Nevada/S.Sutter/N.Sacramento Subwatershed. The Placer/Nevada/S.Sutter/N.Sacramento Subwatershed (PNSSNS) encompasses all or portions of four counties: Placer, Nevada, Sutter, and Sacramento. The primary land uses include agriculture, grazing and timber harvest. Placer County crops include fruit and nut crops, rice, pasture, and hay. Northern Sacramento County produces wine grapes, market milk, nursery stock, orchard crops (apples, oranges, peaches, plums, pears and walnuts), poultry, field corn, calves and cattle, silage corn, rice and processing tomatoes. Main commodities in Sutter County include prunes, rice, walnuts, peaches and milk. Primary commodities in Nevada County include timber, heifer and steers, winegrapes, irrigated pasture, and pasture and rangeland. Important drainages are the American, Sacramento and Bear Rivers, Coon Creek and Pleasant Grove Creek. The main population areas include Sacramento, Roseville, Lincoln, Auburn, and Grass Valley. This subwatershed program is managed by the PNSSNS Subwatershed Group.

Sacramento/Amador Subwatershed. The Sacramento-Amador Subwatershed encompasses portions of two counties, Sacramento (south of the American River) and Amador (north of the Mokelumne watershed). Crops produced include: wine grapes, citrus, mixed pasture, corn (field and silage), grain and hay, alfalfa, walnuts, rice, tomatoes, nursery stock, calves and cattle, poultry and safflower. Important drainages include the Sacramento River and the Cosumnes River. The Cosumnes River contains three segments: the Lower, Middle and Upper Forks. The main tributaries to the Cosumnes River are Deer Creek and Laguna Creek. This subwatershed also includes northern portions of the Sacramento-San Joaquin Delta. The main population center is Elk Grove. The Sacramento Amador Water Quality Association manages this subwatershed program.

Shasta/Tehama Subwatershed. The Shasta/Tehama subwatershed includes Tehama County and Shasta County below Shasta dam. The primary land use is agriculture, which includes pasture, orchards, field and forage crops, winegrapes, alfalfa/grass and small grains, walnuts, prunes/plums, almonds, olives, corn, dry beans, wheat and rice. According to the 2007 county farm reports, about 131,518 acres are irrigated within these two counties. Important drainages are Thomes Creek, Elder Creek, Cottonwood Creek, Red Bank Creek, Burch Creek, and Cow Creek. Main population areas include Corning, Red Bluff and Redding. This subwatershed program is coordinated by the Shasta Tehama Watershed Education Coalition.

Dixon/Solano Subwatershed. This subwatershed is comprised of the eastern portions of Solano County. The topography includes steep, mountainous uplands, low, well-rounded hills, and level soils suitable for irrigated crops or dry farming. The primary land uses are agriculture and grazing. The irrigated crops include field crops such as alfalfa hay, wheat, field corn, walnuts, prunes, almonds, vegetables (predominately processing tomatoes), seeds (dry beans and sunflowers), winegrapes, and nursery stock. The largest population areas are Vacaville and Dixon. Drainages include Ulatis and Pleasants Creeks, Cache Slough and Shag Slough. Portions of the northwestern Sacramento-San Joaquin Delta are included in this subwatershed. The Dixon Resource Conservation District manages this subwatershed program in collaboration with the Solano Resource Conservation District.

Upper Feather River Subwatershed. The Upper Feather River Subwatershed includes all or a portion of Plumas, Sierra and Lassen counties. The Upper Feather River Subwatershed includes 3,222 square miles of land that drains west from the northern Sierra Nevada into the Sacramento River. The Feather River is unique in that the two branches, the North and Middle Forks, originate east of the Sierra Range in the Diamond Mountains and as these two forks flow west, they breach the crest of the Sierra Nevada Range on their way to Lake Oroville. Elevation ranges from 2,250 to over 10,000 feet, and annual precipitation varies broadly from more than 70 inches on the wet western slopes to less than 12 inches on the arid east side. The USDA Forest Service manages over 80% of the watershed, while alluvial valleys are predominantly privately owned and used for livestock grazing and hay production. The significant crops consist primarily of alfalfa, hay, and pasture that may be irrigated, non-irrigated, or range for livestock production. Logging is also a major activity within the subwatershed. Largest urban areas include Quincy, Portola, Loyalton, Greenville, Graeagle, Chester and Sierraville. The Upper Feather River Watershed Group manages this subwatershed program.

Yolo Subwatershed. This subwatershed encompasses all of Yolo County and a small portion of Colusa County. Variable topography includes steep, mountainous uplands, low well-rounded hills, and level soils suitable for irrigated crops or dry farming. The primary land uses are agriculture and grazing. The irrigated crops include field crops such as alfalfa hay, wheat, field corn, winegrapes, rice, walnuts, prunes, almonds, vegetables (predominately processing tomatoes), seed crops (dry beans, sunflowers and vegetables), and nursery stock. Important drainages include Willow Slough, and Cache and Putah Creeks and the Yolo Bypass, which is part of the Sacramento-San Joaquin Delta. Main population areas include Davis, Woodland and West Sacramento. This subwatershed program is managed by the Yolo County Farm Bureau.

Goose Lake.[10] The Goose Lake Basin watershed has been managed for the ILRP through an independent water quality coalition by the Goose Lake Resource Conservation District. Under the current Order (R5-2014-0030-R2) this watershed is included in the Sacramento River Watershed.

The Goose Lake Basin watershed stretches across the border between northeastern California and south-Central Oregon. This high desert watershed encompasses 1,140 square miles of land that drains from both the west and the east into Goose Lake, a closed-basin lake system that no longer has a surface outlet to the nearby Pit River. A low, gravelly terrace separates the lake from a marshy meadow. Most of the significant perennial tributary creeks within the California portion of the basin, such as Lassen and Willow Creeks, flow westward out of the Warner Mountains toward Goose Lake which itself covers thirteen percent of the entire area of the basin. There are approximately 7,314 irrigated agricultural acres within the California portion of the Goose Lake Basin. Center-pivot, wheel-line sprinklers and controlled flooding are the current irrigation practices used within the watershed. Private lands are used predominately for livestock grazing, but are also important for both irrigated and dryland hay production. Major crops types include alfalfa hay, orchardgrass hay, native meadow hay, and irrigated pasture.

IV. Sacramento Valley Water Quality Coalition (SVWQC) Organization

The SVWQC submitted a Notice of Intent in October 2003 and received a Notice of Applicability (NOA) from the Executive Officer in February 2004. The NOA approved the SVWQC's request to operate as a lead entity under the previous Coalition Group Conditional Waiver within its boundaries. Similar to the Coalition Group Conditional Waiver, this Order has been written for a third-party to provide a lead role in conducting monitoring, educating member growers (Members), developing water quality management plans, and interacting with the Central Valley Water Board on behalf of Members. Due to a substantial number of new requirements, this Order requires that the third-party submit a new application to serve as a third-party representing growers under this Order. The Central Valley Water Board anticipates that the SVWQC will continue to operate as the third-party lead entity under this Order.

[10] Goose Lake information is from the Goose Lake Coalition June 2007 and December 2007 Semi-Annual Monitoring reports.

The Sacramento Valley Water Quality Coalition is operated as a partnership between local subwatershed groups coordinated by the Northern California Water Association (NCWA). To effectively implement the Irrigated Lands Regulatory Program (ILRP) requirements, the Coalition and 12 subwatershed groups signed a Memorandum of Agreement that defines the respective roles and responsibilities of the sub-watershed groups, as well as the Northern California Water Association. The subwatershed groups are independently organized by local Resource Conservations Districts, Farm Bureaus or independent organizations established to comply with the ILRP. Owners and operators of farming operations are represented on the boards of the subwatershed organizations and those organizations are represented at quarterly Coalition meetings. The subwatershed organizations provide leadership for grower outreach and implementation of the requirements of Management Plans, while NCWA coordinates monitoring, reporting, and overall communications.

A. Grower Participation under the Conditional Waiver and Compliance Enforcement Activities

The SVWQC currently has 8,429 grower/operator participants and just under 1.2 million enrolled acres.[11] The estimated total irrigated cropland in the Coalition area is 2.36 million acres, or 1.8 million acres excluding commercial rice (*Oryza sativa*) and dairies.[12]

Since 2005, Central Valley Water Board staff's grower outreach efforts in the Coalition area have included issuing about 2,000 California Water Code (CWC) 13267 Orders (Orders) to growers in the Coalition area. These Orders were sent to owners of about 333,000 irrigated acres in the Sacramento Valley. Of this, about 183,000 acres were either already enrolled or became enrolled in the Coalition between 2005-2007; about 66,000 acres were identified as exempt from the program; and about 8,400 acres were found to be planted in rice. Since 2007, about 17,000 acres enrolled as a direct result of Board staff outreach. Staff continues to follow-up on the remaining parcels receiving Orders to determine whether regulatory coverage is necessary .

Since 2008, there have been 23 water quality complaint investigations in the Coalition area. These investigations have involved sediment discharges, irrigation-related tailwater discharges, nuisance foam in waterways, and horse stable discharges. In one compliant, Staff investigated a potential sediment and deleterious pesticide contribution to an ephemeral tributary to Cache Creek in Yolo County. Staff identified the agricultural parcels in the complaint and the investigation resulted in the issuance of a Water Code section 13260 Order. This Order required the grower to obtain regulatory coverage for their irrigated lands and the discharger complied with the Order.

In another complaint, staff investigated a sediment discharge to Hangtown Creek in El Dorado County which also resulted in the identification of the dischargers and issuance of a Water Code section 13260 Order. The discharger complied with the Order by joining the Coalition.

A third complaint of a sediment-laden water discharge into the Little Tule River in Shasta County, resulted in the identification of a discharger and issuance of a Cleanup and Abatement Order. This Order required the recipient to immediately cease the discharge of sediment, clean up and abate the sediment discharged to the Little Tule River, and submit a corrective action technical report. The Discharger complied with the Order.

Since 2008, staff has investigated numerous cases of non-enrollment and issued six ACL's for failure to submit a technical report pursuant to California Water Code (CWC) section 13267. The investigations resulted in the board's issuance of fines of up to $3,000 in four cases.

[11] Reported to the Central Valley Water Board by the SVWQC.
[12] Calculated from the CA Dept. of Conservation, Farmland Mapping and Monitoring Program and CA Dept. of Water Resources Land Use Division.

B. Grower Enrollment Process

The enrollment process whereby growers obtain membership in the third-party group under this Order is designed to incentivize speedy enrollment by increasing both submittal requirements and fees due for those that wait to obtain regulatory coverage. Members in good standing when the Order is adopted will submit a Notice of Confirmation (NOC) to the third-party by 30 June 2015, confirming that they would like to continue membership in the third-party and that they are familiar with the Order's requirements. The NOC may be included as part of any existing submittal or a separate form.

Non-Members will have up to 120-days after the third-party receives its notice of applicability to submit a membership application to the third-party and will be notified by the third-party when their membership is approved. This grace period to allow direct enrollment with the Coalition will streamline the initial enrollment process for the bulk of the irrigated agricultural operations within the Sacramento River Watershed.

Growers that do not enroll or confirm enrollment within the allowable timeframe, or are prompted to apply due to Central Valley Water Board enforcement or inspection, will be required to submit (1) a Notice of Intent (NOI) to comply with the terms and conditions of the Order to the Central Valley Water Board, (2) an administrative processing fee for the increased workload associated with the grower outreach (as applicable), and (3) a Membership application to the third-party group. These additional steps of submitting an NOI and fee directly to the board after the initial enrollment deadline are intended to provide an incentive for growers to enroll promptly. Board staff intends to provide the third-party group with a courtesy copy of the NOA when issued to the grower, so the third-party has confirmation that their Member has received regulatory coverage under the Order.

The third-party will provide an annual Membership List to the Central Valley Water Board that will include everyone who enrolled. The Membership List will specify Members in good standing as well as revoked memberships or pending revocations. The Membership List will also aid in identifying and reaching out to new owners in the case of ownership change. Because third-party pending and revoked memberships could be associated with grower non-compliance with the Order, this type of information is key for the board to prioritize follow-up activities. Board staff will conduct enforcement activities as needed using the list of revoked/pending revocations.

V. Vulnerability

The concept of higher and lower vulnerability areas was integrated into the Order to allow the board to tailor requirements to applicable waste discharge conditions. Resources can be focused on areas that need enhanced water quality protection, because the third-party has the option to identify low vulnerability areas where reduced program requirements would apply.

Vulnerability may be based on, but is not limited to, the physical conditions of the area (soil type, depth to groundwater, beneficial uses, etc.), water quality monitoring data, and the practices used in irrigated agriculture (pesticide permit and use conditions, label requirements, application method, etc.). Additional information such as models, studies, and information collected may also be considered in designating vulnerability areas.

A. Groundwater Quality Vulnerability

High vulnerability areas for groundwater are those areas that meet the requirements for preparing a Groundwater Quality Management Plan or areas identified in the Groundwater Assessment Report, where available information indicates irrigated lands could cause or contribute to an exceedance of water quality objectives or degradation of groundwater quality that may threaten applicable beneficial uses. The Groundwater Assessment Report may rely on water quality data to identify high vulnerability areas and on assessments of hydrogeological conditions and other factors (e.g., areas of high fertilizer use) to identify high vulnerability areas. The third-party is also expected to review readily available studies and assessments of groundwater quality to identify those areas that may be impacted by irrigated agricultural

operations. Examples of assessments that the third-party should review include: the Department of Pesticide Regulation (DPR) Ground Water Protection Areas and the State Water Resources Control Board (State Water Board) Hydrogeologically Vulnerable Areas.

In general, low vulnerability areas for groundwater are areas that do not exhibit characteristics of high vulnerability groundwater areas (as defined in the MRP).

Vulnerability designations will be proposed by the third-party, based on the high and low vulnerability definitions provided in Attachment E of the Order. Vulnerability designations will be refined and updated periodically per the Groundwater Assessment Report and Monitoring Report processes (described in Attachment B, Monitoring and Reporting Program [MRP] Order R5-2014-0030-06). The Executive Officer will make the final determination regarding the irrigated lands waste discharge vulnerability areas.

Figure 2. SVWQC Subwatershed Region Boundaries

VI. Surface Water and Groundwater Monitoring

A. Surface Water Quality Monitoring

1. Irrigated Lands Regulatory Program (ILRP) – Surface Water Quality Monitoring

The SVWQC has been operating under the Monitoring and Reporting Program Order R5-2009-0875 for the Sacramento Valley Water Quality Coalition (MRP Order) under the Amended Coalition Group Conditional Waiver of Waste Discharge Requirements for Discharges from Irrigated Lands Order R5-2006-0053. The MRP Order is based upon and largely consistent with the Monitoring and Reporting Program Order R5-2008-0005 for Coalition Groups (Coalition Group MRP Order). MRP Order R5-2014-0030-06, together with the SVWQC's Management Plan (described below), is the workplan for the monitoring and reporting program, including environmental monitoring, quality assurance and quality control, outreach, and tracking and reporting on progress.

Where the San Joaquin County and Delta area and Sacramento River Watershed area share the Lower Dry Creek Watershed, the third parties will share the responsibility for collecting water quality data to carry out the requirements of the Order. Specifically, the third parties for the Sacramento River Watershed and the San Joaquin County and Delta Area will share responsibility for monitoring the Dry Creek at Alta Mesa Road site because the boundary splits the watershed along the Sacramento and San Joaquin County line. The third parties will use the results to address any water quality issues in their respective portion of the watershed.

Under the previous MRP Order, the SVWQC followed two monitoring strategies, a Primary Strategy and an Alternate Strategy. The Primary Strategy was generally consistent with the approach described in the Coalition Group MRP Order. This strategy included the types of monitoring needed to meet MRP Order objectives: Assessment Monitoring to evaluate the condition of the water body, Core Monitoring to follow water quality trends, and Special Project Monitoring for source identification and other problem solving. Each subwatershed contained one or more monitoring sites where Assessment monitoring was conducted one of every three years, and Core monitoring was conducted the other two years. The monitoring design also provided the SVWQC with the flexibility to assess a variety of relevant factors and propose appropriate monitoring parameters and schedules for each of the ten subwatersheds described in the 2009 MRP Order. For example, pesticide use records and previous monitoring results were used to identify whether a pesticide was being applied, the timing of applications, and if water quality problems had been identified in a particular watershed. The quantities of pesticides applied combined with toxicity information were used to determine relative threat to water quality. Similarly, previous monitoring results and knowledge of watershed geology were used to determine which metals should be monitored. Unlike the 2008 Coalition Group MRP Order, monitoring for the SVWQC MRP Order was not based on pre-determined parameters or schedules. The proposed monitoring parameters and schedules were subject to Executive Officer review and approval.

The optional Alternate Strategy could be implemented in a limited number of subwatershed areas and required development of a Pilot Watershed Management Practices Plan (Pilot Plan). This strategy allowed for a modified monitoring approach when certain criteria were met. A Pilot Plan was required to describe a set of management objectives, a set of management practices that protect water quality, an implementation approach, and a mechanism to track management practice implementation and effectiveness. Additionally, before the Pilot Plan was approved the Coalition was required to show that 75% of growers in the subwatershed area were implementing appropriate management practices. Under the Alternate Strategy, and upon approval by the Executive Officer, Assessment and Core monitoring were not required in the subwatershed area. However, Special Project monitoring was required to continue to meet management plan and Total Maximum Daily Load requirements.

Pilot Plans were approved and implemented in two areas, the Napa-Putah Creek watershed area and El Dorado subwatershed, beginning in 2010. The Napa-Putah Creek Watershed Group represents over 3,700 irrigated acres consisting almost exclusively of winegrapes, with a small amount of olive acreage. Through grower questionnaires and annual site inspections to verify practices on 5% of the acreage, the

watershed group, assisted by the Napa County Resource Conservation District and the Natural Resources Conservation Service, demonstrated that virtually all growers in the area are implementing appropriate practices from a recommended suite of best management practices that protect surface water quality.

The El Dorado County Agricultural Water Quality Management Corporation (EDCAWQMC) surveyed its members, representing over 3,000 irrigated acres, and found that on 99 percent of the acreage at least one management practice that is protective of water quality is in place. Since 2010, EDCAWQMC has coordinated site inspections on 11% of the acreage in the subwatershed, confirming survey results. The vast majority of crops grown in this subwatershed are perennial: tree fruit, winegrapes and Christmas trees. The remaining acres are mostly irrigated pasture.

The basic questions to be answered by the updated surface water quality monitoring program are similar to those established under the Coalition Group MRP Order (R5-2008-005):

1. Are receiving waters to which irrigated lands discharge meeting applicable water quality objectives and Basin Plan provisions?
2. Are irrigated agricultural operations causing or contributing to identified water quality problems?[13] 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 irrigated agricultural operations of Members 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 “Representative” and “Integration” monitoring sites represent sections of the Sacramento River Watershed with irrigated agricultural operations. The requirement to evaluate materials applied to crops or constituents mobilized by irrigated agricultural 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. Integration site monitoring is designed to identify cumulative effects and long-term trends in water quality. In addition, both Special Project monitoring associated with management plans and the monitoring conducted at Representative 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 will allow for a determination as to whether discharges from irrigated lands are protective of beneficial uses and meeting water quality objectives. Other 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 irrigated agriculture are

[13] “Water quality problem” is defined in Attachment E.

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 R5-2014-0030-06 (MRP) has been developed using the SVWQC's MRP Order (R5-2009-0875) as a foundation. However, a number of changes were made in the current MRP (MRP Order R5-2014-0030-06, Part III) 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 five primary changes were to: 1) eliminate core monitoring at the Representative sites; 2) determine pesticide monitoring based on the outcome of Board-led coordination with DPR; 3) modify Assessment monitoring to two years on, two years off—with a third consecutive year of follow-up monitoring for any parameter with an exceedance; 4) add Integration sites; and 5) add a Reduced Monitoring/Management Practices Verification Option that applies to limited areas and requires Executive Officer approval.

The rationale for the above changes is as follows:

1. The general parameters that were monitored as part of previous core monitoring have been of limited value for monitoring trends related to irrigated agricultural waste discharge. Rather than requiring monitoring of general parameters to try to determine trends, trend monitoring will occur through more frequent monitoring at Representative sites and as part of management plan monitoring.
2. The previous MRP Order required the third-party to determine the most appropriate pesticides and metals to monitor based on their own evaluation of the materials that pose greatest risk to water quality. As before, the third-party will be required to evaluate use patterns and properties (e.g., physical-chemical characteristics) and propose a list of metals to monitor. In addition, Central Valley Water Board staff will work with DPR, third-party groups, and engage the ILRP Technical Issues Committee (TIC) to develop a process for identifying the list of pesticides for monitoring by the third-party. The third-party will apply the evaluation factors developed in this process to the relevant conditions in each site sub-watershed and will proposed the pesticides to be monitored in its Monitoring Plan Update.
3. A management plan area is identified when a water quality exceedance occurs at a monitoring site more than once in a three year period. The previous MRP Order required assessment monitoring one year out of three, so a water quality problem likely to occur once a year will not require a management plan where one might be appropriate. The new MRP requires two years of assessment monitoring/two years off at the Representative monitoring sites (any monitoring triggered by management plans would continue even if a site had an "off" year for monitoring).
4. Some sites previously identified as core monitoring sites represent large and diverse watersheds that are more appropriate to characterize water quality across larger areas than the typical monitoring site. Data from these sites should reflect the status of agricultural impacts to water quality on a more regional basis.
5. Some of the subwatersheds (or portions thereof) in the third-party area may have a relatively low potential for surface water quality impacts from irrigated agricultural discharges. Under circumstances where there is a low threat of pesticide discharges; no management plans for toxicity, pesticides, copper or nutrients; and a low intensity of agricultural land use, a reduced monitoring frequency that includes management practices verification may be approved by the Executive Officer.

2. Surface Water Management Plans

a. Sacramento Valley Water Quality Coalition Management Plans

Since 2004, the SVWQC has collected water quality monitoring data at over 50 sites. In 2012, Central Valley Water Board staff analyzed the monitoring data from the SVWQC from 2004 through 2011. Out of more than 73,000 generated data points, about half of the results (35,123) could be compared to the defined water quality objectives (for some constituents, the water quality objective has not been defined yet and evaluation is not possible) [14]. The majority of results were below defined water quality trigger limits; fewer than 4% of all evaluated results exceeded the applicable trigger limits (a total of 1,255 exceedances). Two-thirds of reported exceedances were for field measurements, drinking water and general physical parameters (Figure 3).

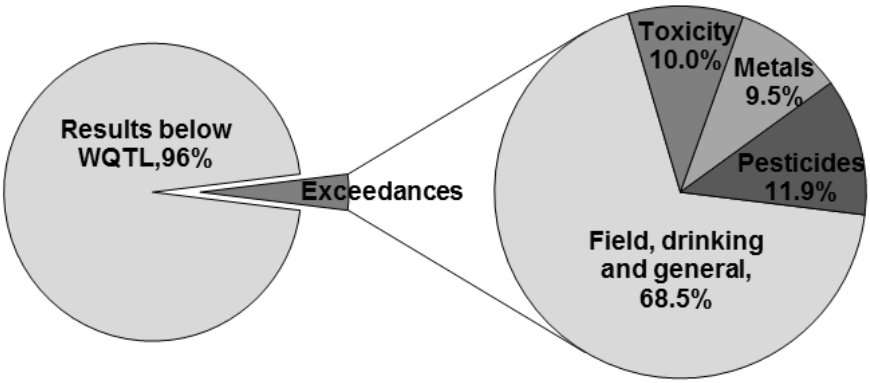

Figure 3. Proportion of exceedances out of all SVWQC monitoring results that could be evaluated against a defined water quality trigger limit (WQTL), and relative contribution of various categories of analytes to the total number of exceedances.

Under Conditional Waiver Order R5-2006-0053, surface water quality management plans (SQMPs) were required for watersheds where there was an exceedance of a water quality objective or trigger limit more than one time in a three year period. There are currently surface water management plans required for the following constituents: arsenic, boron, copper, chlorpyrifos, DDE, diazinon, diuron, dissolved oxygen, electrical conductivity, *E. coli*, lead, malathion, pH, total dissolved solids, sediment toxicity to *Hyalella azteca*, and water column toxicity to algae (*Selenastrum capricornutum*), and water flea (*Ceriodaphnia dubia*). The SVWQC's Management Plan, which covers all of these constituents, was approved on 2 February 2009 and is updated annually.

The SVWQC approach to Management Plans is consistent with the 2008 MRP and includes source identification, management practice implementation, the development of performance goals, evaluation of Management Plan effectiveness and monitoring. To measure grower awareness and implementation of management practices the SVWQC conducted surveys in Management Plan subwatersheds. The subwatershed organizations have conducted grower outreach through direct contact with individuals, outreach and education meetings and newsletters. These outreach efforts are designed and implemented by the subwatershed groups based on their knowledge and understanding of local farming conditions.

There are currently 117 individual Management Plan elements consisting of a constituent/water body combination. Examples of Management Plan elements include *Ceriodaphnia dubia* toxicity in Willow Slough and diazinon in Gilsizer Slough. Figure 4 shows a breakdown of the total number of Management Plan elements and their associated constituent categories. The SVWQC has prioritized these Management Plan categories as a way to effectively allocate limited resources and address important water quality problems. The twenty-one Management Plan elements in the Registered Pesticide and

[14] Trigger limits are discussed below under "Water Quality Objectives."

Toxicity categories are designated high priority. The seven elements in the Legacy Pesticide category are designated medium priority, while the remaining 91 elements in the salinity, dissolved oxygen and pH, pathogen indicator and trace metal categories are designated low priority by SVWQC. Thirteen management plan constituent/waterbody combinations have been deemed complete by the Executive Officer since the beginning of the ILRP. In six of those plans, the source evaluation showed that agriculture was not the source of the problem. In most of the other plans, continued monitoring during and following periods of outreach and grower education showed that the constituents of concern were no longer present in the waterbody.

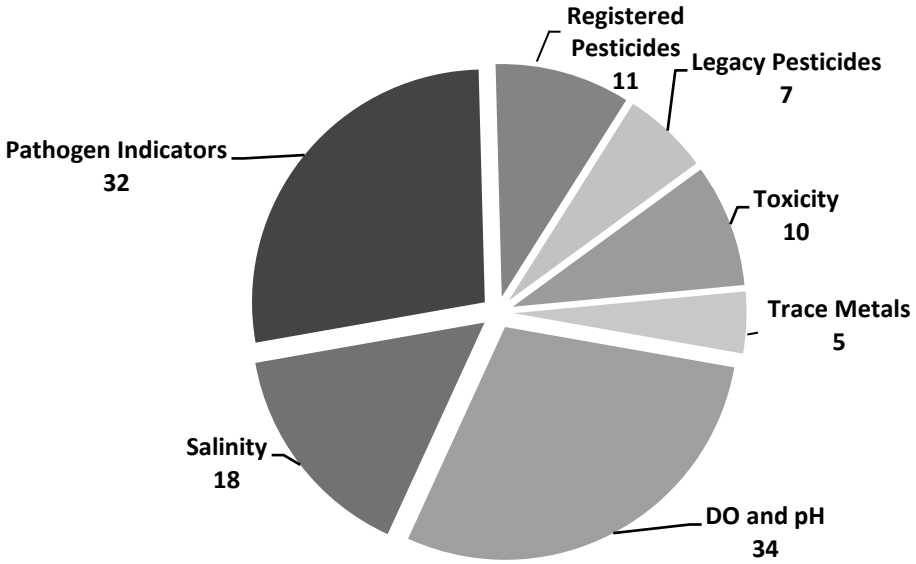

Figure 4. SVWQC Management Plan Categories and the number of individual plans in each category.

Table 2 provides a brief summary of the water quality sampling results for these constituents. This Order requires the SVWQC's 2009 Management Plan to be implemented.

Table 2. Summary of ILRP Surface Water Monitoring Data for Management Plan Constituents in the Sacramento River Watershed, 2005 through 2012. Only exceedances for constituents requiring a management plan are tallied (the sum of tabulated exceedances is not equal to the total number of exceedances).

Constituent	Number of sites requiring a Manage-ment Plan	Number of Exceed-ances in the Watershed	Number of Tests	Range of detected levels	Trigger Limit
Registered Pesticides					
Chlorpyrifos	5	28	855	ND[1] - 0.248 ug/L	0.015 ug/L
Diazinon	1	12	863	ND - 0.601 ug/L	0.10 ug/L
Diuron	2	17	467	ND - 15 ug/L	2.0 ug/L
Malathion	3	12	847	ND - 0.525 ug/L	ND
Legacy Pesticides					
DDE/DDT	7	30	394	ND - 0.0164 ug/L	0.00059 ug/L
Toxicity					
Ceriodaphnia	5	45	812	0 - 219% Survival[2]	Statistically significant reduction in survival[2]
Hyalella	3	27	158	2.5 - 141% Survival[2]	Statistically significant reduction in survival[2]
Selenastrum	2	22	783	11 - 2540% Growth[2]	Statistically significant reduction in growth[2]
Trace Metals					
Arsenic	1	10	351	ND - 16 ug/L	10 ug/L
Boron	3	53	313	3 - 3100 ug/L	700 ug/L
Lead	1	3	333	ND - 43 ug/L	Variable[3]
Salinity					
Electrical Conductivity	11	183	1847	58 - 1677 uS/cm	700 uS/cm
TDS	9	41	675	25 - 1000 mg/L	125 mg/L
Pathogen Indicators					
E. coli	32	266	1487	ND - 2420 MPN/100 ml	235 MPN/100 ml
DO and pH					
Dissolved Oxygen	22	175	1775	0.54 - 21 mg/L	7 mg/L COLD 5 mg.L Warm
pH	12	63	1855	5.98 - 9.8	<6.5 or >8.5

[1] ND = Not detected at measurable levels
[2] Compared to the control sample
[3] Hardness-dependent water quality objective

Since the establishment of Management Plans in the Sacramento River Watershed, subwatershed groups have been developing outside funding to help implement best management practices on farms throughout the region. These projects are a direct result of monitoring information collected for the Irrigated Lands Regulatory Program and the desire on the part of the subwatershed organizations to address water quality problems in their areas. Table 3 shows projects that have been or are currently being implemented in the watershed. These projects are the result of fundraising efforts of local subwatershed organizations and other watershed groups and usually require matching funds to be provided by participating landowners or farm operators.

Table 3. Outside funding for improving and protecting water quality on irrigated lands in the Sacramento River Watershed.

Geographic area	Funding Years	Funding Amount	Funding Source[15]	Funded Improvements	Parcels Affected	Acres Affected
Lower Feather River	2007-2009	$ 905,452	Prop. 50	Cover crops	23	1,300
				Filter strips	25	1,215
Gilsizer Slough	2009-2012	$ 4,260,000	AWEP	High efficiency irrigation systems, nutrient and pest management practices, cover crops and filter strips.	79	5,878
Lower Snake River	2012-2013	$ 2,500,000	BDI	Improved irrigation management on cropland; Improved pest management and erosion control.	48	2,462
Lower Feather River in Butte and Yuba Counties	2012-2013	$ 1,400,000	CCPI	High efficiency irrigation sytems, nutrient management practices, cover crops and filter strips	26	1,663
Colusa-Glenn	2010-2014	$ 5,999,999	AWEP	Irrigation efficiency best management practices, runoff and sedimentation control.	TBD	TBD
Walker Creek	2012-2014	$ 1,799,120	BDI	Improved pest management, vegetative and structural practices to improve water quality, improved irrigation water management.	TBD	TBD
Yolo County	2007-2012	$ 5,000,000	AWEP	Increased irrigation efficiency, decreased tailwater and sedimentation, improve ground water quality.	78	40,000
Western Sacramento Valley	2009-2014	$ 600,435	AWEP	Improved irrigation efficiency for tomato growers.	30	12,000
Solano	2013-2015	$ 1,832,000	BDI	Reduced irrigation water loss, reduced nutrient, sediment and chemical loads to waterways.	TBD	TBD
Solano	2011-2013	$ 395,669	Prop. 84	Convert cropland to drip irrigation.	8	635
Upper Feather River	2006-2008	$ 512,000	Prop. 50	Rancher education, special project monitoring.	TBD	TBD

[15] *Funding Sources:*
AWEP—Agricultural Water Enhancement Program, USDA
BDI—Bay Delta Initiative, USDA
Prop. 50—Water Quality, Supply and Safe Drinking Water Projects. Coastal Wetlands Purchase and Protection, Initiative, State of California
Prop. 84—The Safe Drinking Water, Water Quality and Supply, Flood Control, River and Coastal Protection Bond Act of 2006, State of California
319(h)—Clean Water Act Grant Program, USEPA

Geographic area	Funding Years	Funding Amount	Funding Source[15]	Funded Improvements	Parcels Affected	Acres Affected
Shasta-Tehama	2002-2012	$ 167,000	319(h)	Improved Nutrient management.	97	1,508
				Improved irrigation management.	415	10,537
				Cover crops planting.	38	333
Fall River	2010-2015	$ 400,000	AWEP	Stream and wetland restoration for water quality protection.		1 mile

The following detailed descriptions are three examples of the projects shown in Table 3. In 2009, the Sutter County Resource Conservation District received a five-year, $5.25 million Agricultural Water Enhancement Program (AWEP) grant from Natural Resources Conservation Service (NRCS) to assist growers in Sutter County to implement best management practices that will limit or eliminate offsite irrigation runoff from their orchards. These AWEP funds are helping growers implement a variety of management practices, including converting from flood irrigation to high efficiency micro-jet irrigation systems, installing vegetative cover crops and filter strips, adopting Integrated Pest Management (IPM) practices, and improving irrigation system monitoring. In 2009, the Yuba/Sutter NRCS awarded twelve growers contracts totaling $821,658 to implement water quality BMPs on 596 acres. In 2010, ten more producers were awarded $955,417 to implement water quality BMPs on 825 acres.

Also in 2009, the Colusa-Glenn Subwatershed Program (CGSP) secured a five-year, $5.99 million AWEP grant from the NRCS for surface and ground water projects to enhance water quality and quantity within the Colusa Basin Watershed in Colusa and Glenn Counties. This grant will assist irrigated landowners with implementing Best Management Practices (BMPs) that will increase irrigation system efficiency, decrease runoff, sediment erosion and flooding, and improve surface and ground water quality. Walker Creek and its represented watersheds have been an identified as priority project areas for these funds. Implementation of the AWEP-funded BMPs began in 2010, and includes growers in the represented watersheds. In 2010 and 2011, the Colusa and Glenn County NRCS was allocated $1,578,937 in AWEP funds, approximately 5,017 acres have been funded to implement BMPs.

In 2011, the Coalition for Urban and Rural Environmental Stewardship was awarded over $8 million from the State Water Resources Control Board to implement management practices on Central Valley farms that reduce the discharge of pollutants from agricultural operations into surface waters. Of that funding, nearly $400,000 has been approved for projects on farms in Solano County. These projects are helping growers convert flood-irrigated fields to drip irrigation, eliminating tailwater discharge from approximately 840 acres.

b. Surface Water Management Plans under Order R5-2014-0030-06

Similar to the previous Order (Coalition Group Conditional Waiver), this Order requires the third-party to develop SQMPs for watersheds where there is an exceedance of a water quality objective or trigger limit more than one time in a three year period, including watersheds that are represented by the monitored watershed. 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 of irrigated lands in the identified area. SQMPs are the key mechanism under this Order to help ensure that waste discharges from irrigated lands are meeting Surface Water Receiving Water Limitations in Section III.A of the WDR Order. The limitations apply immediately unless the Member is implementing management practices consistent with an approved Surface Water Quality Management Plan (SQMP) in accordance with the 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 third-party will assist their Members in addressing the identified water quality problem; the types of actions Members will take to address the identified water quality problem; how the third-party 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 the SQMP is consistent with the waste discharge requirements and that 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 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 irrigated agriculture 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 waste discharges from irrigated agriculture are meeting Surface Water Limitation III.A.1 of the WDR Order; D) develop a monitoring strategy to provide feedback on SQMP progress; E) develop methods to evaluate data collected under the SQMP; and F) provide annual reports to the Central Valley Water Board on progress.

Elements A – F are necessary to establish a process by which the third-party 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 Members (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 third-party 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 Executive Officer will consider public comments on proposed SQMPs.

The burden of the SQMP, including costs, is reasonable, since 1) the monitoring and planning costs are significantly lower, when undertaken regionally by the third-party, 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 first step 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 individuals 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, 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.

Diazinon and Chlorpyrifos TMDL Monitoring

In 2006 and 2007 the Water Board adopted Basin Plan Amendments that address the Total Daily Maximum Loads (TMDLs) for diazinon and chlorpyrifos in the Sacramento-San Joaquin Delta and in the Sacramento and Feather Rivers. These amendments to the Basin Plan prohibit the discharge of these pesticides unless the discharger is subject to a waiver of waste discharge requirements or governed by individual or general waste discharge requirements. Under the Coalition Group Conditional Waiver, the SVWQC has complied with the TMDL through monitoring of representative waterways as demonstrated through annual reports submitted with the Management Plan Progress Reports. Under this Order, the third party is required to demonstrate compliance with the diazinon and chlorpyrifos TMDL through monitoring and reporting. The purpose of the TMDL monitoring is to determine whether numeric water quality objectives for chlorpyrifos and diazinon contained in the *Basin Plan Amendments* are continuing to be met in the Sacramento-San Joaquin Delta and in the Sacramento and Feather rivers. Specifically, the *Basin Plan Amendment* identifies the following goals for compliance monitoring for the TMDL:

1. Determine compliance with established water quality objectives for chlorpyrifos and diazinon in the Sacramento and Feather Rivers and the Sacramento-San Joaquin Delta;
2. Determine compliance with established waste load allocations and load allocations for chlorpyrifos and diazinon;
3. Determine the degree of implementation of management practices to reduce off-site migration of chlorpyrifos and diazinon;
4. Determine the effectiveness of management practices and strategies to reduce off-site migration of chlorpyrifos and diazinon;
5. Determine whether alternatives to chlorpyrifos and diazinon are causing surface water quality impacts;
6. Determine whether the discharge causes or contributes to a toxicity impairment due to additive or synergistic effects of multiple pollutants; and
7. Demonstrate that management practices are achieving the lowest pesticide levels technically and economically achievable.

The third-party addresses requirements for TMDL monitoring and reporting through a process similar to that for developing and implementing a management plan, which requires approval of the Executive Officer.

B. Groundwater Quality

1. 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[16].

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)?

[16] 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_advsry_wkgrp_mtg/gmaw_25aug_data_needs.pdf

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 (NO_3-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.

2. 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 third-party must collect sufficient data to describe irrigated agricultural impacts on groundwater quality and to determine whether existing or newly implemented management practices comply with the groundwater receiving water limitations of the Order. The 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 general purpose of the Groundwater Quality Assessment Report is to analyze existing monitoring data and provide the foundation for designing the Management Practices Evaluation Program 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.

A Management Practices Evaluation Program (MPEP) is to be developed 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 (high vulnerability areas). The purpose of the MPEP is to identify whether existing site-specific and/or commodity-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. Given the wide range of management practices/commodities within the third-party's boundaries, it is anticipated that the third-party will rank or prioritize its high vulnerability areas and commodities, and present a phased approach to implementing the MPEP. The MPEP must 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) must be implemented by Members, whether the Member is in a high or low vulnerability area (see section IV.B.21 of the Order).

Since the focus of the MPEP is answering the questions related to management practices, the method or tools to be used are not prescribed by the board. The third-party 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 board anticipates that the MPEP workplan will likely propose using a variety of tools, such as vadose zone monitoring, modeling, and groundwater monitoring. The third-party has the option of developing the workplan as part of a group effort that may include other agricultural water quality coalitions and commodity groups. Such a joint effort may avoid duplication of effort and allow collective resources to be more effectively focused on the highest priority studies, while ensuring the goals of the MPEP are met. Existing monitoring wells can be utilized where available for the MPEP.

The trend monitoring program is designed to determine current water quality conditions of groundwater in the third-party area, and to develop long-term groundwater quality information that can be used to evaluate the regional effects (i.e., not site-specific effects) of irrigated agriculture and its practices. Trend monitoring has been developed to answer GMAW questions 1 and 4. At a minimum, trend monitoring must include annual monitoring for electrical conductivity, pH, dissolved oxygen, temperature, nitrate as nitrogen (N), and once every five year monitoring for total dissolved solids, carbonate, bicarbonate, chloride, sulfate, boron, calcium, sodium, magnesium, and potassium. Existing shallow wells, such as domestic supply wells, will be used for the trend groundwater monitoring program. The use of existing wells is less costly than installing wells specifically designed for groundwater monitoring, while still yielding data which can be compared with historical and future data to evaluate long-term groundwater trends.

As the management practices identified as protective of groundwater quality through the MPEP are implemented, the trend monitoring, together with other data included in updates to the GAR, should show improvements in water quality. The trend monitoring and GAR updates will, therefore, provide a regional view as to whether the collective efforts of Members are resulting in water quality improvements. If groundwater quality trends indicate degradation in low vulnerability areas, then a Groundwater Quality Management Plan must be developed and implemented. Negative trends of groundwater quality in high vulnerability areas over time would be an indicator that the existing Groundwater Quality Management Plan is not effective or is not being effectively implemented.

The third party may also look to and explore using existing monitoring networks such as those being conducted in accordance with local groundwater management plans (e.g., AB 3030, SB 1938, Integrated Regional Water Management Plans).

GMAW question 3, which seeks to differentiate sources of existing impact, cannot be easily answered by traditional groundwater monitoring. The MPEP and 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. The MPEP will be used to help determine whether waste discharge at represented sites is of high enough quality to meet the groundwater limitations of the Order.

Through the MPEP, the potential impacts of irrigated agriculture waste discharges to groundwater will be assessed for different types of practices and site conditions, representative of discharge conditions

throughout the Sacramento River Watershed area. In this way, the board will evaluate whether waste discharges from irrigated agricultural operations are protective of groundwater quality throughout the Sacramento River Watershed. Where the MPEP finds that additional "protective" practices must be implemented in order to ensure that Member waste discharges are in compliance with the Order's receiving water limitations, the Order requires Members to implement such practices, or equivalent practices. This representative MPEP process will ensure that the effects of waste discharges are evaluated and where necessary, additional protective practices are implemented.

3. Data Summary, Pesticides

Monitoring data collected for an assessment of three study areas in the Southern, Middle and Northern Sacramento Valley conducted by the State Water Resources Control Board and the USGS in 2005 through 2008 showed detections of pesticides used by agriculture in groundwater.[17] The most frequently detected pesticides in the study area were atrazine and simazine, which were detected in 12 to 24 percent of wells in the study areas. All pesticide detections were below health-based thresholds and applicable water quality objectives. Analyses were not run for all pesticides used in the study areas.

The California Department of Pesticide Regulation (DPR), as part of its regulatory requirements under the Pesticide Contamination Prevention Act (PCPA) enacted in 1985, is required to maintain a statewide database of wells sampled for pesticide active ingredients and, in consultation with the California Department of Public Health (DPH) and the State Water Resources Control Board (State Water Board), provide an annual report of the data contained in the database and the actions taken to prevent pesticides contamination to the Legislature and other state agencies. These data will be evaluated by the third-party as part of its Groundwater Quality Assessment Report.

DPR also initiated the Ground Water Protection Program that focuses on evaluating the potential for pesticides to move through soil to groundwater, improving contaminant transport modeling tools, and outreach/training programs for pesticide users. There are approximately 192,000 acres of irrigated lands in the Sacramento River Watershed within DPR Groundwater Protection Areas (GWPAs). Of the 192,000 acres, approximately 39,000 acres of the irrigated lands are within DPR GWPAs that are characterized as vulnerable to leaching of pesticides (leaching areas), approximately 152,000 acres are within GWPAs that are characterized as vulnerable to movement of pesticides to groundwater by runoff from fields to areas where they may move to groundwater (runoff areas), and 600 acres of irrigated lands are characterized as both leaching and runoff areas. See Figures 5 and 6 for maps of the Groundwater Protection Areas within the Sacramento River Watershed.

DPR's current groundwater quality monitoring program should be sufficient to identify any emerging pesticides of concern and to track water quality trends of identified pesticides of concern. However, the presence of pesticides in groundwater indicates a discharge of waste subject to Water Board regulation. Therefore, should the board or DPR identify groundwater quality information needs related to pesticides in groundwater, the board may require the third-party to conduct studies or implement a monitoring plan to address those information needs. Where additional information collected indicates a groundwater quality problem, a coordinated effort with DPR to address the identified problem will be initiated and the board may require the third party to develop a groundwater quality management plan (GQMP).

4. Data Summary Nitrates – GeoTracker GAMA

The State Water Board's GeoTracker GAMA (Groundwater Ambient Monitoring and Assessment) online information system integrates groundwater data from multiple sources, such as GAMA, DPR, Department of Water Resources (DWR), USGS, Department of Public Health (DPH), and Lawrence Livermore National Laboratory. Staff queried and analyzed data from GeoTracker GAMA. The

[17] Bennett, G.L., V, Fram, M.S., and Belitz, Kenneth, 2011, Status of groundwater quality in the Southern, Middle, and Northern Sacramento Valley study units, 2005–08—California GAMA Priority Basin Project: U.S. Geological Survey Scientific Investigations Report 2011–5002, 120 p.

GeoTracker GAMA system provides data for over 100,000 sampling locations state-wide and analytical results for a variety of constituents including nitrate. In January 2013 there were 50,392 nitrate results in GeoTracker GAMA within the Sacramento River Watershed Area. These results were collected from environmental monitoring wells and water supply wells (81 percent of the samples were collected from water supply wells). The samples considered in this summary were collected from 1982 through 2012, although 82 percent of the samples were collected in years 2000 or later. Samples were collected within all 21 counties in the Sacramento River Watershed, although most were collected in Sacramento (25 percent), Yolo (10 percent), Butte (10 percent), Shasta (7 percent), Tehama (8 percent), and Solano (7 percent) Counties. These data include monitoring results from wells in areas devoted to rice production.

Sample collection depth information is not available for download from GeoTracker GAMA. However, 81 percent (40,702) of the samples were collected by DPH from water supply wells. DPH monitors water quality in public supply wells, which are typically hundreds to thousands of feet deep and pump large volumes of water from deeper aquifers. This indicates that this particular set of 40,702 nitrate results focuses primarily on conditions in deeper groundwaters. Since DPH primarily monitors active municipal supply wells, wells that have excessive nitrates (that are not treated or blended with better quality water) are generally taken out of water supply service, so monitoring ceases. Therefore, DPH data for active municipal wells generally do not include nitrate-contaminated wells. Additional data collected at shallower depths (where applicable) may be needed to adequately assess current groundwater quality conditions in the area.

Of all sample results for GAMA well data for the Sacramento River Watershed, 3.8 percent were greater than the nitrate drinking water standard of 45 mg/L (as nitrate). An additional 12.7 percent of results fell between the drinking water standard and half of the standard (22.5 mg/L).

Of the 8,881 samples collected from 1982 through 1999 (8,795 reported by DPH), 1.0 percent were greater than the nitrate drinking water standard and an additional 8.7 percent fell between the drinking water standard and half of the standard. Of the 41,511 samples collected from 2000 through 2011, 3.8 percent were greater than the nitrate drinking water standard and an additional 12.7 percent fell between the drinking water standard and half of the standard.

Of the 11,757 nitrate results reported by groups other than DPH that were collected 2000 through 2012, 5.2 percent were greater than the nitrate drinking water standard and an additional 4.2 percent fell between the standard and half of the standard.

There were 1,903 square-mile sections of land (township, range, and section or TRS) reported within the Sacramento River Watershed Area with nitrate results in the GeoTracker GAMA dataset. (Of the 50,392 results, 8,057 do not have associated TRS data.) When data were analyzed per TRS, 1.3 percent of sampled sections had an average nitrate level above the drinking water standard and an additional 5.1 percent of sections had an average nitrate level between 45 and 22.5 mg/L. Eight percent of sampled sections had a maximum nitrate level above 45 mg/L and an additional 18 percent of sampled sections had a maximum level between 45 and 22.5 mg/L. See Figure 7 for a map showing the maximum nitrate result per square mile section of land with detections.

5. Hydrogeologically Vulnerable Areas

In 2000, the State Water Resources Control Board created a map showing locations where published hydrogeologic information indicated conditions that may be more vulnerable to groundwater contamination. They termed these areas “Hydrogeologically Vulnerable Areas.” The map identifies areas where geologic conditions allow recharge to underlying water supply aquifers at rates or volumes substantially higher than in lower permeability or confined areas of the same groundwater basin. The map does not include hydrogeologically vulnerable areas (HVAs) where local groundwater supplies occur mainly in the fractured igneous and metamorphic rocks which underlie the widespread mountain and foothill regions of the Sierra Nevada, or in permeable lava flows which may provide primary recharge for extensive but sparsely populated groundwater basins. See Figures 5 and 6 for maps of the HVAs within the third-party region.

6. Groundwater Quality Management Plans (GQMPs)

Under this Order, groundwater quality management plans will be required where there are exceedances of water quality objectives, where there is a trend of degradation[18] that threatens a beneficial use, as well as for "high vulnerability groundwater areas" (to be designated by the third-party in the Groundwater Assessment Report based on definitions provided in Attachment E).

Instead of development of separate GQMPs, the Order allows for the submittal of a comprehensive GQMP along with the Groundwater Assessment Report. GQMPs will only be required if irrigated lands may cause or contribute to the groundwater quality problem. GQMPs are the key mechanism under this Order to help ensure that waste discharges from irrigated lands are meeting the Groundwater Receiving Water Limitation described in section III.B of the WDR Order. The limitations apply immediately unless the Member is implementing management practices consistent with an approved Groundwater Quality Management Plan (GQMP) for a specified waste in accordance with the time schedule authorized pursuant to section XII of this Order. 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. For example, the ratio of total nitrogen available to crop consumption of nitrogen that is protective of water quality may not be known for different site conditions and crops. However, accounting for the amount of nitrate in irrigation supply water is known to be an effective practice at reducing the amount of excess nitrogen applied.

The GQMPs are work plans describing how the third-party will assist their Members in addressing the identified water quality problem; the types of actions Members will take to address the identified water quality problem; how the third-party 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 the GQMP is consistent with the waste discharge requirements and that 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 irrigated agricultural 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 schedules and milestones to implement practices to ensure discharge from irrigated lands are meeting the Groundwater Receiving Water Limitation in section III.B of the WDR Order, 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.

[18] 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 third-party 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 Members (element C), ensure that adequate feedback monitoring is conducted to allow for evaluation of GQMP effectiveness (elements D and E), and facilitate efficient board review of data collected on the progress of the GQMP (element F).

This Order requires the third-party 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 circulated for public review. Prior to plan approval, the 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 since 1) the monitoring and planning costs are significantly lower when undertaken regionally by the third-party than requiring individual Members to undertake similar monitoring and planning efforts, and 2) the Central Valley Water Board must be informed of the efforts being undertaken by Members to address identified groundwater quality problems. A regional GQMP is, therefore, a reasonable first step to address identified groundwater quality problems,

However, if the regional GQMP does not result in the necessary improvements to water quality, the burden, including costs, of requiring individual Members 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, when regional efforts fail, include, but are not limited to: 1) the need of the board to evaluate the compliance of regulated Members with applicable orders; 2) the need of the board to understand the effectiveness of practices being implemented by Members; and 3) the benefits of improved groundwater quality to all users.

VII. Member Reports

The Order requires that Members prepare farm plans and reports as described below. The Order establishes prioritization for Member completion and updating of the farm plans and reports based on whether the operation is within a high or low vulnerability area. The Central Valley Water Board intends to provide templates for Member reports to the third-party, and the third-party will have an opportunity to comment on the template applicability to its geographic area.

A. Farm Evaluations

The Order requires that all Members complete a farm evaluation describing management practices implemented to protect surface and groundwater quality. 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 Members to complete a farm evaluation. The Order establishes prioritization for Member updating of the evaluations based on whether the operation is within a high or low vulnerability area. Farm evaluations must be maintained at the Member's farming operations headquarters or primary place of business and submitted to the third-party for summary reporting to the Central Valley Water Board.

The farm evaluation is intended to provide the third-party and the Central Valley Water Board with information regarding individual Member implementation of the Order's requirements. Without this information, the board would rely solely on representative surface and groundwater monitoring to determine compliance with water quality objectives. The board would not be able to determine through representative monitoring alone whether all Members are implementing protective practices, such as wellhead protection measures for groundwater. For groundwater protection practices, it may take years in many areas (even decades in some areas) before broad trends in groundwater may be measured and associated with implementation of this Order. Farm evaluations will provide evidence that Members are

implementing management practices to protect groundwater quality while Groundwater Quality Trend Monitoring data and Management Practices Evaluation Program (MPEP) information are collected.

The reporting of practices identified in the farm evaluation will allow the third-party and board to effectively implement the MPEP. 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 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 is being implemented by Members according to the approved schedule.

In addition, reporting of practices will allow the third-party and board to evaluate changes in surface water quality relative to changes in practices. The SQMP 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 Members according to the approved schedule. Absent information on practices being implemented by Members, the board would not be able to determine whether individual Members are complying with the Order.

The focus of the reporting is on parcels in high vulnerability areas. The Central Valley Water Board needs to have an understanding of whether Members are improving practices in those areas where surface or groundwater quality are most impacted (or potentially impacted). Reporting frequency is annual for all farming operations in high vulnerability areas. The reporting frequency is every five years for all farming operations in low vulnerability areas. The Executive Officer is given the discretion to reduce the reporting frequency for Members in high vulnerability areas, if there are minimal year to year changes in the practices reported and the implemented practices are protective of water quality. 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.

While the focus of the reporting is on high vulnerability areas, the MPEP requirement affects management practices implemented in both high and low vulnerability areas. Management practices identified as protective of groundwater quality through the MPEP (or equivalent practices) must be implemented by Members, where applicable, whether the Member is in a high or low vulnerability area (see section IV.B.21 of the Order).

B. Nitrogen Management Plans

Nitrate derived from both agricultural and non-agricultural sources has resulted in degradation and/or pollution of groundwater beneath agricultural areas in California's Central Valley.[19] As shown in Figure 7, there are a number of wells within the Sacramento River Watershed area with nitrate concentrations that are higher than drinking water quality objectives. To address these concerns, the Order requires that Members implement practices that minimize excess nitrogen application relative to crop consumption. Proper nutrient management will work to reduce excess plant nutrients, such as nitrogen, from reaching state waters. Nitrogen management must take site-specific conditions into consideration in identifying steps that will be taken and practices that will be implemented to minimize nitrate movement through surface runoff and leaching past the root zone.

All Members will be required to complete a nitrogen management plan according to the schedule in the Order. Growers in low vulnerability areas are required to prepare nitrogen management plans, but do not need to certify the plans or provide summary reports to the third-party. Should the groundwater vulnerability designation change from "low" to "high" vulnerability, those Members in the previously designated low vulnerability area would then need to have their nitrogen management plan certified and

[19] 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. Appendix A, page 46.

submit summary reports in accordance with a schedule issued by the Executive Officer. For all Members, the plan must be maintained at the Member's farming operations headquarters or primary place of business.

For Members located within a high vulnerability groundwater area, for which nitrate is identified as a constituent of concern, the plan must be certified in one of the following ways:

- Self-certified by the Member who attends a California Department of Food and Agriculture or other Executive Officer approved training program for nitrogen plan certification. The Member must retain written documentation of their attendance in the training program; or

- Self-certified by the Member that the plan adheres to a site-specific recommendation from the Natural Resources Conservation Service (NRCS) or the University of California Cooperative Extension. The Member must retain written documentation of the recommendation provided; or

- Certified by a nitrogen management plan specialist as defined in Attachment E of this Order. Such specialists include Professional Soil Scientists, Professional Agronomists, Crop Advisors[20] certified by the American Society of Agronomy, or Technical Service Providers certified in nutrient management in California by the Natural Resources Conservation Service (NRCS).

- 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.

The Order requires nitrogen management reporting (nitrogen management plan summary reports) for Members in high vulnerability groundwater areas. The first nitrogen management plan summary report must be submitted one year after the first nitrogen management plan must be developed, unless a deadline extension is approved by the Central Valley Water Board. The nitrogen management plan summary report provides information based on what was actually done the previous crop year, while the plan indicates what is planned for the upcoming crop year. Therefore, the first summary report is due the year following the implementation of the first nitrogen management plan. This reporting will provide the third-party and the Central Valley Water Board with information regarding individual Member implementation of the Order's requirements. Without this information, the board would rely primarily on groundwater monitoring to determine compliance with water quality objectives. Groundwater monitoring alone would not provide a real-time indication as to whether individual Members are managing nutrients to protect groundwater. Improved nitrogen management may take place relatively quickly, although it may take many years before broad trends in nitrate reduction in groundwater may be measured. Nitrogen management reporting will provide evidence that Members are managing nutrients to protect groundwater quality while trend data and Management Practices Evaluation Program (MPEP) information are collected.

Wetland managers have provided comments that fertilizers are not applied to managed wetlands. Therefore, the nitrogen management plan requirements do not apply to parcels that are operated solely as managed wetlands.

In the case of irrigated pasture, there is evidence that will no external nitrogen inputs (e.g., synthetic or organic fertilizer, stockpiled manure, compost), either mechanical harvest and haying, or livestock grazing reduce nitrogen leaching and can lower nitrate concentrations in the groundwater.[21] Direct

[20] 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.
[21] Owens LB, Bonta JV. (2004). Reduction of Nitrate Leaching with haying or Grazing and Omission of Nitrogen Fertilizer. Journal of Environmental Quality 33: 1230-12037.

nutrient returns in excretions of grazing livestock are a portion of the total nutrient supply in the forage eaten by animals, and are not considered a fertilizer application to irrigated pasture. Hence, Nitrogen Management Plans and Summary Reports are not required for irrigated pasture where no external nitrogen is applied.

C. Spatial Resolution of Nitrogen Management Plan and Farm Evaluation Information

The Order requires reporting to the Central Valley Water Board of nitrogen management information and management practices identified through the farm evaluation. These data are required to be associated with the township (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.

Information collected from nitrogen management summary reports will be provided annually. The nitrogen management data collected by the third-party from individual Members will be aggregated by the township where the enrolled parcel is located and will not be associated with the Member or their enrolled parcel. For example, the third-party may have information submitted for 180 different parcels in a given township. At a minimum, the board would receive a statistical summary of those 180 data records describing the range, percentiles (10th, 25th, 50th, 75th, 90th), and any outliers for similar soil conditions and similar crops in that township. A box and whisker plot or equivalent tabular or graphical presentation of the data approved by the Executive Officer may be used. Based on this analysis, the Central Valley Water Board intends to work with the third-party to ensure that those Members who are not meeting the nitrogen management performance standards identified in the Order improve their practices. As part of its annual review of the monitoring report submitted by the third-party, the board will evaluate the effectiveness of third-party outreach efforts and trends associated with nitrogen management. The board intends to request information from the third-party for those Members who, based on the board's evaluation of available information, do not appear to be meeting nitrogen management performance standards. The reporting of nitrogen management data may be adjusted based on the outcomes of the efforts of the State Water Resources Control Board's Expert Panel and the California Department of Food and Agriculture's Nitrogen Tracking and Reporting System Task Force (see Finding 49 and the State Water Board's Report to the Legislature[22]).

In order to determine whether growers in a given township are improving their practices, the third-party will need to assess the data collected from Farm Evaluations and evaluate trends. The third-party's assessment and evaluation, along with the data used to make the evaluation, will be provided in the third-party'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 Members are in compliance and the board will be able to identify specific data records for additional follow-up (e.g., requesting that the third-party provide the Member name and parcel associated with the data record). 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 third-party to submit the management practice or nitrogen management plan summary information in a manner that specifically identifies individual Members and their parcels.

D. Sediment and Erosion Control Plans

The Order requires that Members with the potential to cause erosion and discharge sediment that may degrade surface waters prepare a Sediment and Erosion Control Plan, either individually, or as part of a watershed/subwatershed based (or collective) plan. Control of sediment discharge will work to achieve water quality objectives associated with sediment and also water quality objectives associated with sediment bound materials such as pesticides. To ensure that water quality is being protected, this Order requires that individual sediment and erosion control plans be prepared in one of the following ways:

[22] State Water Board Resources Control Board. 2013. Report to the Legislature, Recommendations Addressing Nitrate in Groundwater <http://www.swrcb.ca.gov/water_issues/programs/nitrate_project/docs/nitrate_rpt.pdf>

- The sediment and erosion control plan must adhere to the site-specific recommendation from the Natural Resources Conservation Service (NRCS), NRCS technical service provider, the University of California Cooperative Extension, the local Resource Conservation District; or conform to a local county ordinance applicable to erosion and sediment control on agricultural lands. The Member must retain written documentation of the recommendation provided and certify that they are implementing the recommendation; or

- The plan must be prepared and self-certified by the Member, who has completed a training program that the Executive Officer concurs provides necessary training for sediment and erosion control plan development; or

- The plan must be written, amended, and certified by a qualified professional possessing one of the registrations shown in Table 4 below; or

- The plan must be prepared and 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 plan meets the objectives and requirements of this Order.

Table 4. Qualified Sediment and Erosion Control Plan Developers

Title/Certification	Certifier
Professional Civil Engineer	State of California
Professional Geologist or Engineering Geologist	State of California
Landscape Architect	State of California
Professional Hydrologist	American Institute of Hydrology
Certified Professional in Erosion and Sediment Control™ (CPESC)	EnviroCert International Inc.
Certified Professional in Storm Water Quality™ (CPSWQ)	EnviroCert International Inc.
Certified Soil Scientist	American Society of Agronomy
Certified Conservation Planner	NRCS

A watershed/subwatershed based (or collective) plan must be written, amended and certified by a qualified professional possessing one of the registrations shown in Table 4.

The sediment and erosion control plan will: (1) help identify the sources of sediment that affect the quality of storm water and irrigation water discharges; and (2) describe and ensure the implementation of water quality management practices to reduce or eliminate sediment and other pollutants bound to sediment in storm water and irrigation water discharges. The individual plan must be appropriate for the Member's operations and will be developed and implemented to address site specific conditions. Each farming operation is unique and requires specific description and selection of water quality management practices needed to address waste discharges of sediment. The plan must be maintained at the farming operations headquarters or primary place of business.

Watershed/subwatershed based (or collective) sediment and erosion control plans will take advantage of local hydrological conditions where storm water and irrigation runoff from more than one parcel collect prior to discharge to downstream waters. Under these conditions, multiple properties subject to erosion and sedimentation may participate cooperatively in management practices that limit sediment discharge. This may include management practices on drainage ditches that service multiple farm parcels where a common sediment control structure such as a settling basin would efficiently prevent sediment discharge for all the cooperating coalition members. However, Members that are participating in the collective plan still must implement erosion and sediment control measures applicable to their individual operation. Collective plans require Executive Officer approval before implementation.

To assist Members in determining whether they need to prepare a sediment and erosion control plan, the third-party must prepare a sediment and erosion control assessment report that identifies the areas susceptible to erosion and the discharge of sediment that could impact receiving waters. In addition, the Executive Officer may identify areas requiring such plans based on evidence of ongoing erosion or sediment control problems.

E. Templates for Farm Evaluation, Nitrogen Management Plan, Nitrogen Management Plan Summary Report, and Sediment and Erosion Control Plans

The Central Valley Water Board intends to provide templates (Farm Evaluation; Nitrogen Management Plan, Nitrogen Management Plan Summary Report, and Sediment and Erosion Control Plan) to all Members that must be used to comply with the applicable reporting requirements of this Order. In issuing Order R5-2012-0116, the Central Valley Water Board allowed agricultural water quality coalitions and commodity groups to jointly propose templates to be used to satisfy the requirements of Order R5-2012-0116. The Central Valley Water Board understands that the Sacramento Valley Water Quality Coalition and commodity groups in the Sacramento River area have worked with the East San Joaquin Water Quality Coalition to develop templates. The purposes of the templates are to collect information consistently across irrigated agricultural areas and commodities, and to minimize the costs for growers to provide that information. Consistent information collection will facilitate analysis within a geographic area and across the Central Valley. Those purposes may not be met if the Central Valley Water Board includes provisions that allows for submittal of proposed templates under each third-party order issued as part of the long-term irrigated lands regulatory program. However, the Central Valley Water Board recognizes that templates may require modifications for different geographic areas. Therefore, although the third-party will not have an opportunity to develop new templates under this Order, the third-party will have an opportunity to provide comments on the templates' applicability to its geographic area.

F. Managed Wetlands

Around 22,000 acres of the Order area are wetlands enrolled as members of the Sacramento Valley Water Quality Coalition. These wetlands represent a small fraction of the wetlands that historically occurred prior to conversion to agriculture and other land uses and the creation of complex water control infrastructure that now exists. A common wetland management objective is to create and maintain native plant communities and provide habitat for a diverse range of species. Managed wetlands support migratory and resident birds, listed species, and other fish and wildlife. As an example, the Sacramento National Wildlife Refuge Complex in the Central Valley has been recognized for its importance to waterfowl and shorebirds. Natural and managed wetlands may also provide other environmental benefits, such as flood management and improved water quality.[23] The capacity for both managed and natural wetlands to reduce contaminants such as nitrates, phosphorus, pesticides, and sediments is well-documented.[22]

The potential number of pollutants discharged from managed wetlands is limited compared with agricultural operations. Many wetland management activities differ from agricultural management activities and, therefore, the timing and nature of the potential effects on water quality are different. Seasonal wetlands are typically flooded between August and October and drawn down in spring between March and May. Depending on spring weather conditions, the type of wetland vegetation that is being encouraged, or the need to discourage certain species, irrigation can occur any time from May through July and can vary in both frequency and duration. Irrigation of a relatively limited acreage of cropland may also occur during summer. Crops grown to provide food or habitat for waterfowl include irrigated pasture, small grains, corn and winter wheat. Flood-up and drawdown periods typically result in some discharge flows from wetlands.[24] Infrastructure in managed wetlands includes levees, water

[23] Carter, V. (1997). Technical Aspects of Wetlands, Wetland Hydrology, Water Quality and Associated Functions. National Summary of Wetland Resources, United States Geological Survey Water Supply Paper 2425.
[24] 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.

control structures, and other features to control the timing, depth, and duration of flooding. Examples of infrastructure maintenance activities include levee repair, and water control structure, ditch, and swale cleaning. Habitat and vegetation management activities include disking and mowing in seasonal wetlands following the drawdown period.[23]

During the development of the ILRP Orders, concerns were raised regarding the applicability of templates for Farm Evaluation, Nitrogen Management Plan and Nitrogen Management Summary Report, and Sediment and Erosion Control Plan to wetland areas. Wetland managers provided comments that fertilizers and pesticides are not a part of the practices on wetlands, and that wetlands typically have elements associated with practices to prevent and minimize sediment discharge and erosion, such as holding ponds, vegetative buffers, minimum tillage.

However, there is evidence that wetland drainage can have negative impacts on water quality [25], [26],[27],[28] including salts and high biological oxygen demand. Therefore, discharges from wetlands may contain wastes that could affect the quality of waters of the state. In addition, the Basin Plan's methylmercury control programs identify that some managed wetlands may be sources of methylmercury. As part of the Delta methylmercury control program, studies are being conducted with managed wetlands operators to develop and evaluate water and land management practices to control methylmercury discharges.[29]

Since fertilizers are not used on managed wetlands, and wetlands generally act as a sedimentation basin and do not contribute to excess sediment, this Order does not require the preparation of nitrogen management plans and nitrogen management plan summary reports, or sediment erosion and control plans for parcels that are solely operated as a managed wetland. Given the unique environmental conditions and effects of wetlands on water quality, the board recognizes that a different evaluation template from the standard farm evaluation template may be better suited for managed wetlands. To address the unique features of managed wetlands, an alternate managed wetland template may be crafted and proposed by the third-party. Any template to be used for wetlands reporting should be developed collaboratively by the third-party, wetland managing agencies, Resource Conservation Districts, and federal and state agencies.

G. Small Farming Operations

In counties within the Sacramento River Watershed, small farming operations are operated by approximately 61 percent of the growers, but account for only approximately 4% of the total irrigated lands.[30] During the development of other Orders, concerns were raised regarding the ability of small farms to comply with the requirements of the Long Term Irrigated Lands Program. In those cases, the board recognized that small farming operations may have more limited resources and access to technical experts, and accordingly, provided additional time for small farming operations to initially

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[25] Stringfellow WT, Hanlon JS, Borglin SE, Quinn NWT. (2008). Comparison of wetland and agriculture drainage as sources of biochemical oxygen demand to the San Joaquin River, California. Agricultural Water Management 95: 527-538.
[26] Quinn, NWT. (2009). Environmental decision support system development for seasonal wetland salt management in a river basin subjected to water quality regulation. Agricultural Water Management 96: 247-254.
[27] California Department of Fish and Game and Suisun Resource Conservation District. (No Date). Initial Draft, Conceptual Model for Managed Wetlands in Suisun Marsh. Compiled by DFG and SRCD staff, 129 pages.
[28] Diaz FJ, O'Geen AT,Dahlgren RA. (2012) Agricultural pollutant removal by constructed wetlands: Implications for water management and design. Agricultural Water Management 104: 171-183.
[29] See http://www.waterboards.ca.gov/centralvalley/water_issues/tmdl/central_valley_projects/delta_hg/stakeholder_meetings/2012mar06/2012mar06_irrwetlands_pres.pdf
[30] Data are for Butte, Colusa, El Dorado, Glenn, Lake, Modoc, Nevada, Placer, Plumas, Sacramento, Shasta, Solano, Sutter, Tehama, Yolo and Yuba Counties; United States Department of Agriculture. 2007. *Census of Agriculture*.

prepare applicable farm evaluations, nitrogen management plans, and sediment and erosion control plans. However, in this case, additional time for small farming operations is found to not be necessary.

Specifically, because the Sacramento River Watershed is so large and diverse, grower outreach and communication is facilitated through thirteen (13) sub-watershed organizations, which make up the Sacramento Valley Water Quality Coalition. As discussed further above in Section V, the sub-watershed organizations are independently organized, and owners and operators of all sizes are represented on the boards of the sub-watershed organizations. Due to the small, localized nature of the sub-watershed groups, there is more direct and frequent communication with owners and operators of all sizes by the sub-watershed organization. This means that the sub-watershed groups are able to educate and assist all of their Members on the new requirements in a timely and efficient manner without dividing the membership based on operation size. Further, because of the localized nature of the sub-watershed groups, the sub-watershed groups have determined that separate requirements for owners and operators based on operation size would increase their administrative burden, which would ultimately increase costs for all of their Members, including small farming operations. Thus, in this case, it is unnecessary to provide different timeframes for small farming operations in the Order.

VIII. 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 irrigated agriculture on water quality. Areas that are represented by the monitoring site have the same or similar characteristics as the area discharging to the monitored site. The land use immediately upstream of the monitored sites is agriculture and the mix of crops around the monitored sites is similar to the crop mix in unmonitored areas (See Appendix MRP-3). Therefore, it is reasonable to use the results from the monitored sites to draw conclusions regarding water quality impacts in areas with similar crops and similar practices that are not being monitored.

The benefits of representative monitoring include the ability to determine whether water bodies accepting discharges from numerous irrigated lands are meeting receiving water limitations (e.g., through selection of representative sampling locations and representative MPEP studies). Representative monitoring also allows the Central Valley Water Board to determine whether practices are protective of water quality. In addition, Members must report the practices they are implementing to protect water quality.

Through the Management Practices Evaluation Program and the Surface Water Quality Management Plans and Groundwater Quality Management Plans, the third-party must evaluate the effectiveness of management practices in protecting water quality. Surface water quality management plans have been triggered throughout the Order area under the Conditional Waiver; therefore, the evaluation of surface water quality management practices is applicable for the whole Order area. Members must report the practices they are implementing to protect water quality, Therefore, information from the evaluation of management practices (per the Management Plans and Management Practices Evaluation Program) can be applied to individual Members to determine whether their implemented practices are protective of surface water and groundwater quality.

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.[31] 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

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

provide information required to assess compliance for represented Members, reducing the number of samples needed to evaluate compliance with the requirements of this Order. The third-party is tasked with ensuring that selected monitoring sites are representative of waste discharges from all irrigated agricultural operations within the Order's boundaries.

This Order requires the third-party to provide technical reports. These reports may include special studies at the direction of 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[32] and the board's compliance and enforcement activities will also allow the board to determine whether Members are complying with this Order.

IX. 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 third-party or Members 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.

X. 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 manner[33].
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

[32] See Table 7 for a summary of required third-party and Member reports.
[33] State Water Resources Control Board. 2010. Water Quality Enforcement Policy. <http://www.swrcb.ca.gov/water_issues/programs/enforcement/docs/enf_policy_final111709.pdf>

(ACLs) imposed by a Regional Water Board or the State Water Board. A 30-day public comment period 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 Grower Participation

To facilitate grower participation in the Irrigated Lands Regulatory Program (ILRP) under the Conditional Waiver, the Central Valley Water Board staff engaged in outreach and followed the progressive enforcement series of actions. For example, staff had sent outreach postcards informing non-participating landowners who potentially require coverage under the ILRP. Water Code Section 13267 Orders for technical reports had been issued to landowners who first received an outreach postcard and did not respond. Landowners were required to respond to postcards or 13267 Orders by obtaining the required regulatory coverage, or claiming an exemption from the ILRP requirements. The Central Valley Water Board staff routinely conducted inspections to verify landowner exemption claims; occasionally the outcome of inspections led to an enforcement action for failure to obtain appropriate regulatory coverage.

Upon the adoption of the Eastern San Joaquin River Watershed Order in December 2012, staff sent letters to thousands of landowners who may now require regulatory coverage, since like this Order, the Eastern San Joaquin River Watershed Order addresses discharge to both groundwater and surface water. Parcels that potentially need regulatory coverage are identified from readily available information sources, such as county tax assessor records; aerial photography; and the California Department of Conservation's Farmland Mapping and Monitoring Program. The staff also conducts inspections in the field to verify that parcels have an irrigated agricultural operation. The Executive Officer sends Water Code Section 13260 Directives when inspections verify that parcels require coverage under the ILRP, when growers who used to be third-party members are no longer listed on the annual membership lists, or when growers who received Executive Officer approval to join a third-party have not done so. The 13260 Directives require growers to enroll or re-instate their membership with a third-party, obtain coverage for their discharges under other applicable general waste requirements, or submit a Report of Waste Discharge to the Central Valley Water Board. As the highest level of informal enforcement, Notices of Violation (NOV's) are sent to growers who fail to respond to Orders and Directives, and direct the recipients to obtain the proper regulatory coverage for their waste discharges. The board intends to issue Administrative Civil Liability Complaints to those growers who do not respond to the NOV. In addition, the board may enroll those growers under the general WDRs for dischargers not participating in a third-party group (R5-2013-0100), after such growers are provided an opportunity for a hearing.

B. 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.

C. Compliance/Enforcement Related to Information Collected

As a part of field inspections, and with the consent of the Member, owner or authorized representative as required by applicable laws, staff may also review information and farm plans prepared by Members. The Executive Officer will request information, as necessary, from Members and the third-party 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 Members, 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.

XI. Water Quality Objectives

Surface water and groundwater receiving water limitations in section III of the Order specify that waste discharge from irrigated lands may not cause or contribute to an exceedance of water quality objectives in surface water or underlying groundwater, 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) and the Water Quality Control Plan for the San Francisco Bay/Sacramento-San Joaquin Delta Estuary (Bay/Delta 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, the salinity objectives, and the turbidity objectives; and (2) the narrative objectives, including the biostimulatory substances objective, the chemical constituents 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 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. See 40 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 section 64431, 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.

A. 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 Regulations (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 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 third-party representing Members, with an opportunity to review and comment on the trigger limits. The Executive Officer will then provide the trigger limits to the third-party. 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.

XII. Non-Point Source (NPS) Program

This Order regulates waste discharges from irrigated agricultural lands to state waters as an NPS program. Accordingly, the 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.

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

(1) The purpose of the long-term irrigated lands regulatory program, of which this Order is an implementing mechanism, is stated above under the section titled "Goals and Objectives of the Irrigated Lands Regulatory Program."[34] The program goals and objectives include meeting water

[34] 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.

quality objectives. The requirements of this Order include requirements to meet applicable water quality objectives and the requirements of State Water Board Resolution 68-16 (antidegradation requirements). Further discussion of this Order's implementation of antidegradation requirements 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 Report[35] and evaluated in the Program Environmental Impact Report (PEIR)[36] for the long-term ILRP. This Order requires each individual 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 that each Member must complete an Irrigation and Nutrient Management Plan (INMP). This Order further 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 third-party identify management practices and develop a process for evaluating the effectiveness of such practices. The requirements of this 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 this Order are consistent with Key Element 3.

(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. This feedback will allow iterative implementation of practices to ensure that program goals are achieved. The feedback mechanisms required by this Order are consistent with Key Element 4.

(5) This Order establishes the following consequences where requirements are not met:

(a) The third-party or Members 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 Members, or all Members where the third-party fails to meet the requirements of this Order, to submit a report of waste discharge to obtain individual waste discharge requirements from the Central Valley Water Board (i.e., revoke coverage under this Order).

March. (ICF 05508.05.) Sacramento, CA. Prepared for Central Valley Regional Water Quality Control Board, Sacramento, CA.

[35] 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.

[36] 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.

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

XIII. California Environmental Quality Act (CEQA)

For the 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.). The Central Valley Water Board has prepared a Final Program Environmental Impact Report (PEIR)[37] that analyzes the potential environmental impacts of six program 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 Members 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 this Order, Members 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 goals. 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 requirements of this Order would lead to implementation of the above practices within the Sacramento River Watershed to a similar degree as is described for Alternatives 2-6 analyzed in the PEIR. Also, the requirements of this Order will require installation of monitoring wells (with the extent depending on the adequacy of existing wells for water quality monitoring).

As described in the PEIR for Alternatives 2-6, the combination of an operator's choice of management practice and where that practice is implemented (i.e., located within a sensitive resource area) may result in significant environmental impacts for the following resource areas:

- Cultural resources: Potential loss of resources from construction and operation of management practices and monitoring wells.

[37] 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

- Noise and vibration: Exposure of sensitive land uses to noise from construction and operation of management practices (e.g., construction of tailwater return system, pump noise) and monitoring wells.
- Air quality: Generation of construction and operational emissions from management practices and monitoring wells (e.g., equipment and pump emissions generated during construction and continued operation of practices).
- Climate change: Cumulative, from a potential increase in greenhouse gas emissions.
- Vegetation and wildlife: Loss of habitat, wildlife, and wetland communities from reduced surface water discharge and construction and operation of practices and monitoring wells (e.g., loss of habitat if a practice is sited in a previously undisturbed area). Cumulative loss of habitat.
- Fisheries: Loss of habitat from construction of management practices, monitoring wells, and toxicity attributable to coagulant additives.
- Agriculture resources: Loss of farmland from increased regulatory cost. Cumulative loss of agriculture resources.

The above is a generalized summary of affected resource areas. The reader is directed to the Attachment D, Findings of Fact and Statement of Overriding Considerations, of this Order for specific impacts and discussion. Attachment D provides a listing of the above impacts, the written findings regarding those impacts consistent with § 15091 of the CEQA Guidelines, and the explanation for each finding.

A. Mitigation Measures

The impacts described above, except for agriculture resources, cumulative climate change, and cumulative vegetation and wildlife 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 sedimentation basin in a portion of the property that is already developed rather than in an area that provides riparian habitat). Where no alternate practice or less sensitive location for a practice exists, this Order requires that the third-party and Members 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 R5-2014-0030-06.

XIV. 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 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 Members 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; Members are expected to meet the farm management performance standards and, thereby, achieve best practicable treatment or control (BPTC), where applicable. All Members must prepare and implement a farm-specific irrigation and nitrogen management plan. In addition, each Member with the potential to cause erosion and discharge sediment that may degrade surface waters must prepare and implement a sediment and erosion control plan. Implementation of the sediment/erosion control plan should result in achieving BPTC for sediment

associated pollutants. 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 the third-party. 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 third party must report on the implementation of practices by its Members. Failure of individual members 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.[38]

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.

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,"[39] 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.[40] The Water Code directs the State Water

[38] 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.

[39] 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.

[40] 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."

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 indicates 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.[41] 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, page12). 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 used by the discharger or similarly situated dischargers.[42] 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 2000-07). The requirement of BPTC is discussed in greater detail below.

[41] The state antidegradation policy was adopted in 1968, therefore water quality as far back as 1968 may be relevant to an antidegradation analysis. For purposes of application of the federal antidegradation policy only, the relevant year would be 1975.
[42] See *Questions and Answers, State Water Resources Control Board, Resolution 68-16* (February 16, 1995).

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 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 a 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 River Watershed to construct provisions in this Order to meet the substantive requirements of Resolution 68-16.[43]

This Order regulates discharges from thousands of individual fields to a very large number of water bodies within the Sacramento River Watershed. There is no comprehensive, waste constituent–specific information available for all surface waters and groundwater aquifers accepting irrigated agricultural wastes that would allow site-specific assessment of current conditions. Likewise, there are no comprehensive historic data.[44]

However, data collected by the Central Valley Water Board, dischargers, educational institutions, and others demonstrate that many water bodies within the Sacramento River Watershed are already impaired for various constituents that are or could be associated with irrigated agricultural activities. As described above, there are surface water quality management plan requirements for the following constituents and indicators: arsenic, boron, chlorpyrifos, DDE, diazinon, diuron, dissolved oxygen, electrical conductivity, *E. coli*, lead, malathion, pH, total dissolved solids, sediment toxicity, and water column toxicity to algae, and water flea (Table 2). Those same data collection efforts also indicate that other surface water bodies within the watershed meet objectives for particular constituents and would be considered “high quality waters” with respect to those constituents.

Similarly, as described above in the “Groundwater Quality Monitoring” section, eight percent of sampled square mile sections (i.e., sections containing wells for which sampling information is available) had a maximum nitrate level above applicable water quality objectives. While the lack of historical data prevents the board from being able to determine whether the groundwater represented by these wells are considered “high quality” with respect to nitrates[45], because it is unknown when the degradation occurred, available data show that currently existing quality of certain water bodies is better than the water quality objectives; for example, deeper groundwaters, represented by municipal supply wells, are generally high quality with respect to pesticides and nitrates. Degradation of such waters can be permitted only consistent with the state and federal antidegradation policies.

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.”*Consistency with BPTC and the “Best Efforts” Approach*
Due to the numerous commodities being grown on irrigated agricultural lands and varying hydrogeologic conditions within the Sacramento River Watershed, identification of a specific technology or treatment device as BPTC or “best efforts” has not been accomplished. By contrast, there are a variety of technologies that have been shown to be effective in protecting water quality. For example, Chapter 5 of

[43] State Water Resources Control Board, WQO 2018-0002 held that in a general order, a general review and analysis of readily available data is sufficient to determine the baseline water quality. (WQO 2018-0002, p. 78.)
[44]Irrigated lands discharges have been regulated under a conditional waiver since 1982, but comprehensive data as to trends under the waiver are not available.
[45] As mentioned above, water quality dating as far back as 1968 may be needed to determine whether such waters are considered “high quality” under Resolution 68-16.

the Irrigated Lands Program Existing Conditions Report[46] (ECR) describes that there are numerous management practices that Members could implement to achieve water quality protection goals. The Central Valley Water Board recognizes that there is often site-specific, crop-specific, and regional variability that affects the selection of appropriate management practices, as well as design constraints and pollution-control effectiveness of various practices.

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, the State Water Board found that these requirements satisfied BPTC/best efforts.[47] The Central Valley Water Board continues to review new data and finds that this Order still satisfies 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.

Farm Management Performance Standards[48]

This Order establishes on farm standards for implementation of management practices that all Members 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 Members 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

[46] California Regional Water Quality Control Board, Central Valley Region, and Jones and Stokes. 2008. *Irrigated Lands Regulatory Program Existing Conditions Report.* Sacramento, CA.
[47] State Water Board, WQO 2018-0002, p. 79-80.
[48] Table 7 includes a summary of the reports that will be provided by Members or third-party to provide the information needed to evaluate compliance with the Farm Management Performance Standards.

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").[49] 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.

- USEPA's National Management Measures to Control Nonpoint Source Pollution from Agriculture (EPA 841-B-03-004, July 2003;),[50] "*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, erosion and sediment control. Practices implemented to minimize waste discharge offsite and erosion (performance standards a and b) are consistent with this management measure to achieve erosion and sediment control. The Order requires that all Members implement sediment discharge and erosion prevention practices to minimize or eliminate the discharge of sediment above background levels. Those Members that have the potential to cause erosion and discharge sediment that may degrade surface waters must develop a farm-specific sediment and erosion control plan.

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 irrigation and nitrogen management plans (INMP) to be developed by Members within both

[49] *California's Management Measures for Polluted Runoff* (<http://www.waterboards.ca.gov/water_issues/programs/nps/docs/cammpr/info.pdf>)
[50] *National Management Measures to Control Nonpoint Source Pollution from Agriculture* (<http://water.epa.gov/polwaste/nps/agriculture/agmm_index.cfm>)

high vulnerability and low vulnerability groundwater areas. INMPs require Members to document how their fertilizer use management practices meet performance standards. This order also requires the use of multi-year A/R ratio, which will lead to more effective management practices over time. 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 Members 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, grazing management. As described in the state Agriculture Management Measures document, this measure is "*intended to protect sensitive areas (including streambanks, lakes, wetlands, estuaries, and riparian zones) by reducing direct loadings of animal wastes and sediment.*" While none of the Order's farm management goals directly address grazing management, performance standards a, b, e and f, when considered by an irrigated pasture operation would lead to the same management practices, e.g., preventing erosion, discharge of sediment, and ensuring that animal waste loadings do not cause pollution, nuisance, and achieve water quality objectives. The Order also requires that all Members implement sediment discharge and erosion prevention practices to minimize or eliminate the discharge of sediment above background levels.

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 Members to minimize waste discharge to surface and groundwater will lead to practices that will also achieve this management measure. For example, a Member may choose to implement efficient irrigation management programs (e.g., timing, uniformity testing), technologies (e.g., spray, drip irrigation, tailwater return), or other methods to minimize discharge of waste to surface water and percolation to groundwater.

Management measure 7, education and outreach. The Order requires that third-party groups conduct education and outreach activities to inform Members of program requirements and water quality problems.

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., agriculture), compliance with the requirements of the Order will lead to implementation of BPTC/best efforts by all Members.

1. <u>Additional Planning and Implementation Measures (SQMP/GQMPs)</u>

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 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 Members and 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 within the Sacramento River Watershed that require growers to implement specific groundwater quality protection requirements for certain pesticides. 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 third-party 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 Members 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/GQMPs. Therefore, though Members 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.

2. <u>Management Practices Evaluation Program (MPEP) and Other Reporting and Planning Requirements</u>

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. In high vulnerability groundwater areas, the third-party

must develop and implement a Management Practices Evaluation Program (MPEP). 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 Members who farm under similar conditions (e.g., crop type, soil conditions) (see provision IV.B.21 of the Order).

Farm management performance standards are applicable to both high and low vulnerability areas. The major difference in high and low vulnerability areas is the priority for action. High vulnerability areas may contain both high and low quality waters with respect to constituents discharged by irrigated agriculture, and the MPEP and other reporting, planning, and implementation requirements will determine and require actions to achieve BPTC and best efforts for high and low quality waters, respectively. Because low vulnerability areas present less of a threat of degradation or pollution, additional time is provided, or a lower level of review and certification is required, for some of the planning and reporting requirements. Also, while an MPEP is not required for the low vulnerability areas, the actions required by the MPEP must be implemented as applicable by Members in both high and low vulnerability areas, and will therefore result in the implementation of BPTC and best efforts in high and low vulnerability areas, and will inform evaluation of compliance with performance standards in all areas. The Order 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 “Representative” monitoring sites. 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 irrigated agriculture. For groundwater, a trend monitoring program is required in both “low vulnerability” and “high vulnerability” areas. The trend monitoring for the low vulnerability areas 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 the area would be re-designated as a high vulnerability area.

The third-party is required to prepare a Groundwater Quality Assessment Report (GAR) and update that report every five years. The GAR will include an identification of high vulnerability and low vulnerability areas, including identification of constituents that could cause degradation. The initial submittal of the GAR will include a compilation of water quality data, which the board and third-party will use to evaluate trends. The periodic updates to the GAR will require the consideration of data collected by the third-party, as well as other organizations, and will also allow the board and third-party to evaluate trends. The GAR will provide 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” and all of the requirements associated with a high vulnerability area would apply to those Members.

All Members will also need to report on their management practices through the farm evaluation process. In addition, all members will need to prepare INMPs prepared in accordance with the INMP templates approved by the Executive Officer. The plans require Members to report their irrigation and nitrogen application practices and to document how their fertilizer use management practices minimize excess nutrient application relative to crop consumption. The INMP will also include the multi-year A/R ratio and A-R difference. The planning requirements are phased according to threat level such that members in low vulnerability areas have more time to complete their plans than those in high vulnerability areas. Through the farm evaluation, the Member must identify “…on-farm management

practices implemented to achieve the Order's farm management performance standards.". INMPs and INMP summary reports provide indicators as to whether the Member is meeting the performance standard to minimize excess nutrient application relative to crop consumption of nitrogen. The MPEP study process would be used to determine whether the nitrogen consumption ratio meets the performance standard of the Order.

C. *Summary*

Members are required to implement practices to meet the above performance standards and periodically review the effectiveness of implemented practices and make improvements where necessary. Members in both high and low vulnerability areas will identify the practices they are implementing to achieve water quality protection requirements as part of farm evaluations and INMPs. Members in high vulnerability areas have additional requirements associated with the SQMPs/GQMPs; preparing sediment and erosion control plans; implementing 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 Members are meeting the requirements of the Order, if the third-party led efforts are not effective in ensuring receiving water limitations are achieved.

Requirements for individual farm evaluations, INMPs, sediment and erosion control 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 irrigated 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 those Members in low vulnerability areas of the types of practices that meet the performance standards. In addition, even Members in low vulnerability groundwater areas must implement practices (or equivalent practices) that are identified as protective through the MPEP studies (where these practices are applicable to the Members' site conditions). The farm evaluations and INMP requirements for low vulnerability areas provide indicators as to whether Members 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 irrigated agriculture achieve and maintain compliance with water quality objectives and beneficial uses;

- The requirements implementing the Order will result in use of BPTC where irrigated agricultural 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 (PEIR, Appendix A); Direct employment is associated with agricultural crops and agricultural support services is approximately 31,445 jobs in the Order area.[51] Widespread to total elimination of farming would result in loss of these jobs, which would disproportionally impact already disadvantaged communities that depend on farm jobs and the farm economy. The total output of the agricultural sector, including support services is approximately $3,464 million, which could be substantially reduced if no degradation were allowed[52];
- 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. The Order is anticipated to result in an estimated loss of 124,196 acres of irrigated lands. Failing to authorize degradation of high quality waters could result in a significantly higher loss of farmland;
- 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 irrigated lands. The Order is designed to prevent irrigated lands 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 irrigated agricultural 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 Members to achieve water quality management practice performance standards and includes farm management practices monitoring to ensure practices are implemented to achieve these standards. The iterative process whereby Members implement practices to achieve farm management performance standards, coupled with representative surface and groundwater monitoring feedback to assess whether the practices are effective, will prevent degradation of surface and groundwater quality above water quality objectives. The requirement that Members not cause or contribute to exceedances of water quality objectives is a

[51] Estimated based on the total number of jobs in the Sacramento River Basin associated with agricultural crops and support services (Table 4-9 of the Economics Report) times the ratio of irrigated lands under this Order in the Sacramento River Basin (1,699,568) divided by the total irrigated acreage in the Sacramento River Basin (2,286,395 from Table 3-3 of the Economics Report). In addition, a similar calculation was made for the Cosumnes River Basin (77,432 acres), as a fraction of the San Joaquin River Basin (2,126,028 acres).
[52] Estimated based on the total industrial output in the Sacramento River Basin associated with agricultural crops and support services (Table 4-3 of the Economics Report) times the ratio of irrigated lands under this Order (1,699,568) divided by the total irrigated acreage in the Sacramento River Basin (2,286,395 from Table 3-3 of the Economics Report). In addition, a similar calculation was made for the Cosumnes River Basin (77,432 acres), as a fraction of the San Joaquin River Basin (2,126,028 acres).

ceiling. Achieving the farm management performance standards will, in many instances, result in preventing degradation or degradation well below water quality objectives.[53]

The State Water Board found that any degradation allowed by the Modified Waste Discharge Requirements for Growers within the Eastern San Joaquin River Watershed that are Members of a Third Party Group is consistent with the maximum benefit to the people of the state.[54] The maximum benefit analysis in that order are the same as in this Order. The Central Valley Water Board continues to review new data and concludes that the "maximum benefit" analysis has not changed.

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.

XV. California Water Code Sections 13141 and 13241

The total estimated 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 $8.58 per acre greater than the cost associated with the protection of surface water only under the Coalition Group Conditional Waiver. The total estimated average cost of compliance associated with continuation of the previous Coalition Group Conditional Waiver within the Sacramento River Watershed is expected to be approximately 172 million dollars per year ($97.06 per acre annually). The total average estimated cost of this Order is 187 million dollars per year ($105.64 per acre annually).

Approximately $97.02 of the estimated $105.64 per acre annual cost of the Order is associated with implementation of water quality management practices (see discussion below for a breakdown of estimated costs). This Order does not require that Members implement specific water quality management practices.[55] Many of the management practices that have water quality benefits can have other economic and environmental benefits (e.g., improved irrigation can reduce water and energy consumption, as well as reduce runoff). Management practice selection will be based on decisions by individual Members in consideration of the unique conditions of their irrigated agricultural lands; 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 Members 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 third-party 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 members covered by this Order is $0.75/acre. The combined total estimated average costs that include third-party and state fees are estimated to be $6.32 /acre annually or less than 6% of the total estimated average cost of $105.64 per acre. There are a

[53] For example, for certain crops and farming operations, total elimination of tailwater during the irrigation season is achievable, which would totally eliminate the discharge of any wastes in surface water runoff from the farming operation during the irrigation season. Some farming operations may be able to eliminate the use of a pesticide that is degrading water quality.
[54] State Water Board, WQO 2018-0002, p. 79.
[55] Per Water Code section 13360, the Central Valley Water Board may not specify the manner in which a Member complies with water quality requirements.

number of funding programs that may be available to assist growers in the implementation of water quality management practices through grants and loans (e.g., Environmental Quality Incentives Program, State Water Board Agricultural Drainage Management Loan Program). Following is a discussion regarding derivation of the cost estimate for the Order.

This Order, which implements the long-term ILRP within the Sacramento River Watershed, 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, surface and groundwater management plans, and watershed-based 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; sediment and erosion control plan (under Alternative 3, "farm plan") recommendation/ certification requirements similar to Alternative 3; 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 these portions of the Order are estimated using the costs for these components of Alternative 2 and Alternative 5 given in the *Draft Technical Memorandum Concerning the Economic Analysis of the Irrigated Lands Regulatory Program* (Economics Report).[56] Table 5 summarizes the major regulatory elements of the Order and provides reference to the PEIR alternative basis.

Table 5. Summary of regulatory elements

Order elements	Equivalent element from Alternatives 2-5
Third-party administration	Alternative 2
Farm evaluation Sediment and erosion control plan Nitrogen management plans	Alternative 4: farm water quality management plan and certified nutrient management plan
Recommended/ certified sediment and erosion plans	Alternative 3: certification of farm water quality plans
Surface and groundwater management plans	Alternative 2 surface and groundwater management plans
Watershed-based surface water monitoring	Alternative 2 watershed-based surface water monitoring
Trend groundwater quality monitoring	Alternative 4 regional groundwater quality trend 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	Alternative 4 nutrient tracking
Management practices implementation	Alternative 2 or 4 f 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. Additional costs have been included for third-party preparation of: notice of applicability, sediment and erosion assessment report, monitoring report. Farm evaluation, sediment and erosion control plan and nitrogen management planning (farm planning) costs are estimated using the costs for farm planning (page 2-22, Economics Report, $2,500 per Member plus an additional annual cost for updating farm planning documents and associated reporting). Alternative 3's cost estimate for certification of individual farm water quality plans is included to estimate the potential cost of recommended/certified sediment and erosion control plans (Table 2-20, Economics Report).

[56] 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

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 watershed-based surface water monitoring approach. Total trend groundwater monitoring and reporting costs are estimated using regional groundwater monitoring costs and planning costs given on page 2-20 and Table 2-14 of the Economics Report, respectively. Additional cost estimates have been included for the groundwater quality assessment report and management practices evaluation program. Costs for installation of groundwater monitoring wells are estimated using the costs shown in Table 2-15 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." Management practices costs have been estimated for the Sacramento River Watershed generally using the methodology outlined in pages 2-6 to 2-16 of the Economics Report. Estimated average annualized costs per acre of the Order relative to full implementation of the current waiver program in the Sacramento River Watershed are summarized below in Table 6. [57]

Table 6. Estimated annual average per acre cost of the Order relative to full implementation of the current program (PEIR Alternative 1) in the Sacramento River Watershed.

	Order	Current program	Change
Administration	1.41	1.06	0.35
Farm planning	2.30	--	2.30
Monitoring/reporting/tracking	4.91	1.09	3.82
Management practices*	97.02	94.90	2.11
Total†	105.64	97.06	8.58

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

† Totals may not add up due to rounding.

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.[58] The estimated total average annual cost of this Order of $187 million dollars ($105.64 per acre) falls within 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 estimated total average annual cost per acre of Alternative 4 in the Sacramento River Watershed is $101. The Order, based substantially on Alternative 4, has a similar average annual cost to members and is expected to have similar overall economic impacts, as described in the Economics Report.[59] This is because all costs of the ILRP are paid by Members through fees or other direct costs (e.g., individual implementation of improved practices). Therefore potential economic effects to individual Members associated with such costs will also be similar in nature.

[57] This discussion provides a brief summary of the major costs. A detailed cost spreadsheet showing calculations and assumptions for this analysis is part of the administrative record.

[58] 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).

[59] The estimated average cost of this Order is less than the cost estimated for Alternative 4. It is expected that the costs will not be exactly the same because the Order is based on components of alternatives other than Alternative 4 alone. Utilization of Alternative 4's potential economic impacts provides a conservative measurement of the Order's potential economic effects.

XVI. 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) and the State Water Board's Water Quality Control Plan for the San Francisco Bay/Sacramento-San Joaquin Delta Estuary (Bay/Delta Plan) identify applicable beneficial uses of surface and groundwater within the Sacramento River Basin. The Order protects the beneficial uses identified in the Basin Plan and the Bay/Delta Plan. Applicable past, present, and probable future beneficial uses of Sacramento and San Joaquin River Basin waters were considered by the Central Valley Water Board as part of the Basin Planning process and are reflected in the Basin Plan. 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 the Bay-Delta 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 irrigated lands program requirements as part of the Central Valley Water Board's 2008 *Irrigated Lands Regulatory Program Existing Conditions Report* and the PEIR. 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. This 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

This 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 irrigated lands to surface water and groundwater do not cause or contribute to an exceedance of applicable water quality objectives. SQMPs and GQMPs are required in areas where water quality objectives are not being met –where irrigated lands are a potential source of the concern, and in areas where irrigated agriculture 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 irrigated lands are not causing or contributing to the water quality problem. The SQMPs and GQMPs must be designed to ensure that waste discharges from irrigated 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 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. This 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. This 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 Farmland[60] due to increased regulatory costs. This information has been used in the context of this Order to estimate potential loss of Important Farmland within the area regulated by this Order. It is estimated that approximately 123,611 acres of Important Farmland within the Order area potentially would be removed from production under full implementation of the previous conditional waiver program (Conditional Waiver Order R5-2006-0053), equivalent to Alternative 1 in the PEIR; it is estimated that an additional 584 acres of Important Farmland may be removed from production due to increased regulatory costs of this Order (total of approximately 124,196 acres, as described in Attachment D of this Order).[61] As described in the Economics Report, most of the estimated losses would be to lower value crop land, such as irrigated pasture and forage crops.

As described in Attachment D, the board also considered the costs and potential loss of Important Farmland associated with directly regulating growers and requiring individual monitoring.

Using the results from the Economics Report (Table 2-22) for the Sacramento River basin and the San Joaquin River basin, the projected cost of Alternative 5 is an average of $192.77 per acre per year, with a projected $53.41 per acre annual cost for monitoring and $8.73 per acre for administration (primarily board staff costs). The estimated average cost of this Order is $105.64 per acre annually with an estimated average annual cost of $4.91 per acre for monitoring. For the approximately 1,777,000 in the Order area, the additional $87.13 per acre average annual cost for an individual monitoring/direct regulatory oversight approach would increase costs for the whole watershed by approximately $155 million per year.

The costs associated with Alternative 5 would result in a projected loss of 212,000[62] acres of irrigated lands, as compared to the estimated loss associated with this Order of approximately 124,000 acres.

The additional costs and potential additional loss of Important Farmland associated with direct, individual regulation can be avoided should growers be able to successfully protect water quality under this Order. The successful monitoring, reporting, and outreach efforts by the Coalition and the improvements in water quality under the Coalition Group waiver suggest that providing a less costly alternative for a grower to comply with Porter-Cologne is reasonable, appropriate, and has a strong likelihood of success.

(e) The need for developing housing within the region

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

(f) The need to develop and use recycled water

[60] 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.
[61] Staff calculated the potential loss of agricultural land for Alternative 1 from Table 5.10-2, Volume I of the draft PEIR based on the ratio of irrigated lands covered by the tentative Order to the total irrigated lands in the Sacramento River Basin. In addition, a similar calculation was made for the Cosumnes River Basin, as a fraction of the San Joaquin River Basin. (This is the same methodology as described in Attachment D, pages 16 and 17 for calculating potential loss of Important Farmland under the tentative Order).
[62] Staff calculated the potential loss of agricultural land for Alternative 5 from Table 5.10-6, Volume I of the draft PEIR using the same methodology as described in the previous footnote, and Attachment D, pages 16 and 17.

This Order does not establish any requirements for the use or purveyance of recycled wastewater. Where an agricultural operation may have access to recycled wastewater of appropriate quality for application to 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 recycle wastewater on agricultural fields instead of providing requirements under this Order may complicate potential use of recycled wastewater on agricultural fields. However, the location of agricultural 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 agricultural fields in the Sacramento River Watershed.

Table 7. Reports, plans and monitoring required under the Order. Requirements are associated with fulfilling the Non-Point Source Policy, Resolution 68-16, and requirements contained in the Basin Plans. Page numbers refer to Information Sheet, unless noted otherwise.

Frequency	Report/Plan or Type of Monitoring	Purpose/Intent	Information Sheet Page
Third-Party Requirements			
One-time	**Sediment Discharge and Erosion Assessment Report** (General Order § VIII.E; AttB § VI)	● Identify areas subject to erosion and sediment discharge. ● Basis for determining which Members must prepare Sediment and Erosion Control Plans to meet Performance Standards **b**, **e**, and **f**.	AttB, p.34
	Groundwater Quality Assessment Report (GAR) (General Order § VIII.D.1; AttB § IV.A)	● Identify groundwater vulnerability areas and constituents of concern for high vulnerability areas - provides foundation for management plan, MPEP and trend monitoring. ● Identify areas in which to meet Performance Standards **c**, **e**, **f**, and potentially **d**; Members may need to take additional action.	14-15, 27-28, 56
	Comprehensive Management Plan (Surface/Groundwater Quality) (General Order § VIII.I)	● Develop regional plans to collectively address identified water quality problems or degradation trends (based on monitoring results/GAR). ● Develop strategy with schedule and milestones to encourage and track implementation of management practices necessary to meet Performance Standards and describe feedback monitoring.	20-25, 31-32, 55-57
Annually	**Annual Monitoring Report/ Management Plan Status Report** (General Order § VIII.H; AttB § V)	● Summarize and assess monitoring results and management practice implementation status/effectiveness. ● Provide feedback on whether monitoring, management plans, or management practice implementation needs to be adjusted.	35
	Trend Groundwater Quality Monitoring (General Order § VIII.D.3; AttB § IV.C)	● Assess groundwater quality and track spatial/temporal trends. ● Based on vulnerability designations in GAR. ●Provide feedback on regional scale as to whether management practices are improving water quality.	39
Variable	**Surface Water Monitoring** (AttB § III)	● Assess surface water quality and track spatial/temporal trends, feedback on progress towards meeting goals ● Results inform management plan implementation. ● Provide feedback at sites representative of irrigated lands discharges as to whether management practices are improving water quality.	17-19
	Management Practices Evaluation Program (MPEP) (General Order § VIII.D.2; AttB § IV.B)	● Identify existing management practices protective of groundwater quality and assess effectiveness of new management practices. ● Provide information needed to identify which practices meet Performance Standards **c**, **e**, and **f**. ● Based on identification of constituents of concern for high vulnerability areas in GAR.	27-29, 33, 56
Member Requirements			
One-time	**Sediment Discharge and Erosion Control Plan** (General Order § VII.C)	● Identify site-specific practices the Member is implementing to meet Performance Standard **b** in high vulnerability areas. ● Optionally, participate in a watershed/subwatershed-based Sediment and Erosion Control Plan ● Only Members in high vulnerability areas, as identified in the Sediment Discharge and Erosion Assessment Report, need to develop the Plan (updated as needed).	36-38, 54
Annually	**Nitrogen Management Plan (NMP)/ NMP Summary Report** (General Order § VII.D)	● Reduce nitrogen discharges to groundwater to meet nitrate standards. ● Describe if/how Performance Standard **d** is met.***** ● Provide information needed to determine whether Member is causing or contributing to nitrate problem (NMP Summary Report). ● Only Members in high vulnerability areas, as identified in GAR, need to prepare Summary Reports.	34-38, 47, 54, 57
	Farm Evaluation (General Order § VII.B)	● Provide information on management practices implemented by the Member to meet Performance Standards **a**-**g.*** ● Reporting every five (5) years in low vulnerability areas.	32-33, 35, 37-38, 57-58

Table continues on the next page (Farm Management Performance Standards).

Table 7. Continued

Farm Management Performance Standards constitute best practicable treatment or control (BPTC)/best efforts (Attachment A, page 52):

a. Minimize waste discharge offsite in surface water (General Order § IV.B.20)
b. Minimize or eliminate the discharge of sediment above background levels (General Order § IV.B.7)
c. Minimize percolation of waste to groundwater (General Order § IV.B.20)
d. Minimize excess nutrient application relative to crop need (General Order § IV.B.8)
e. Prevent pollution and nuisance (General Order § III.A.1, § III.B.1, § IV.A.3)
f. Achieve and maintain water quality objectives and beneficial uses (General Order § III.A.1, § III.B.1, § IV.A.3)
g. Protect wellheads from surface water intrusion (General Order § IV.B.20)

***** Members may need to take additional action (i.e., improve practices), if Performance Standard is not met.

Figure 5 Groundwater Protection Areas and Hydrogeologically Vulnerable Areas within the Sacramento River Watershed Area, northern section.

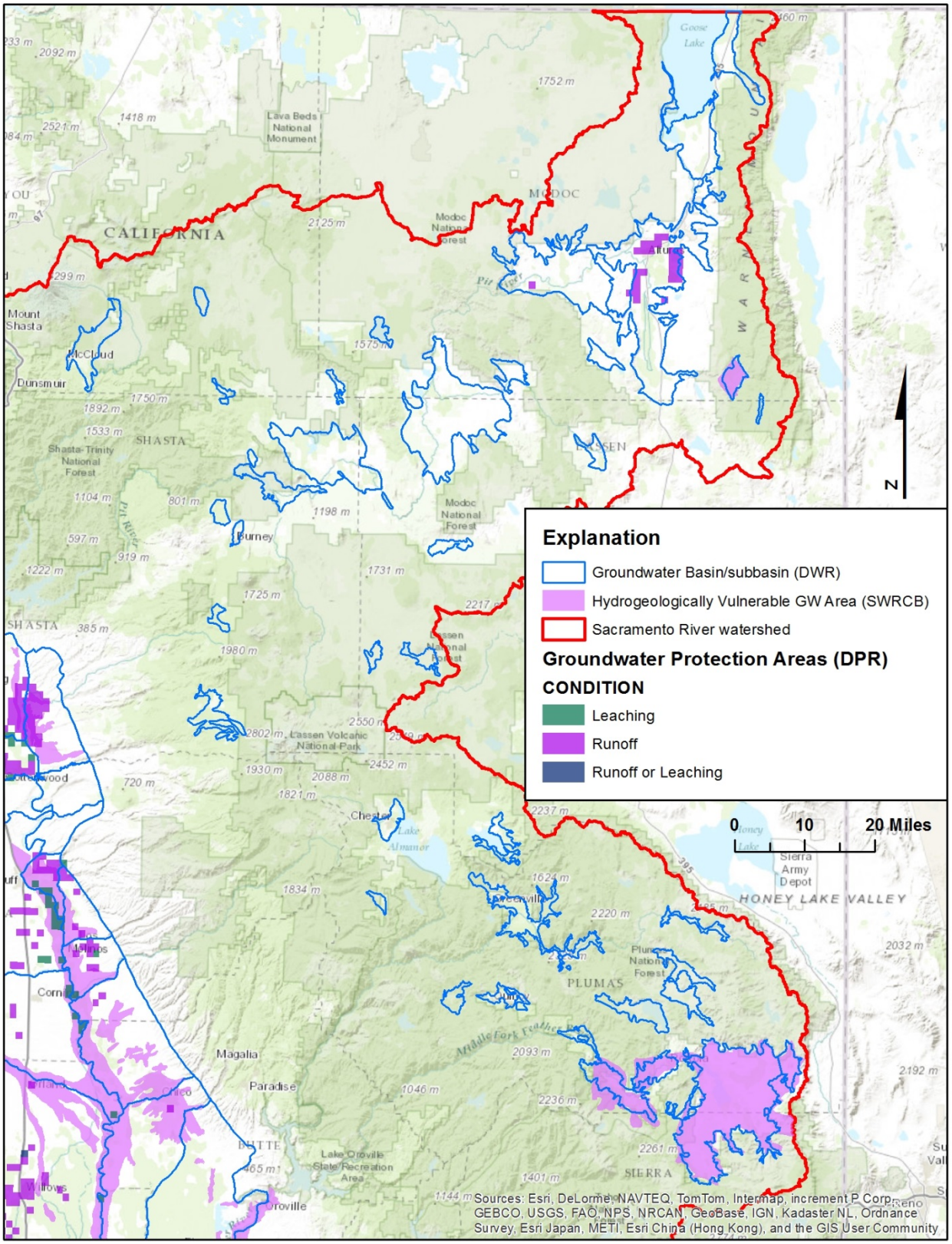


Figure 6. Groundwater Protection Areas and Hydrogeologically Vulnerable Areas within the Sacramento River Watershed Area, southern section

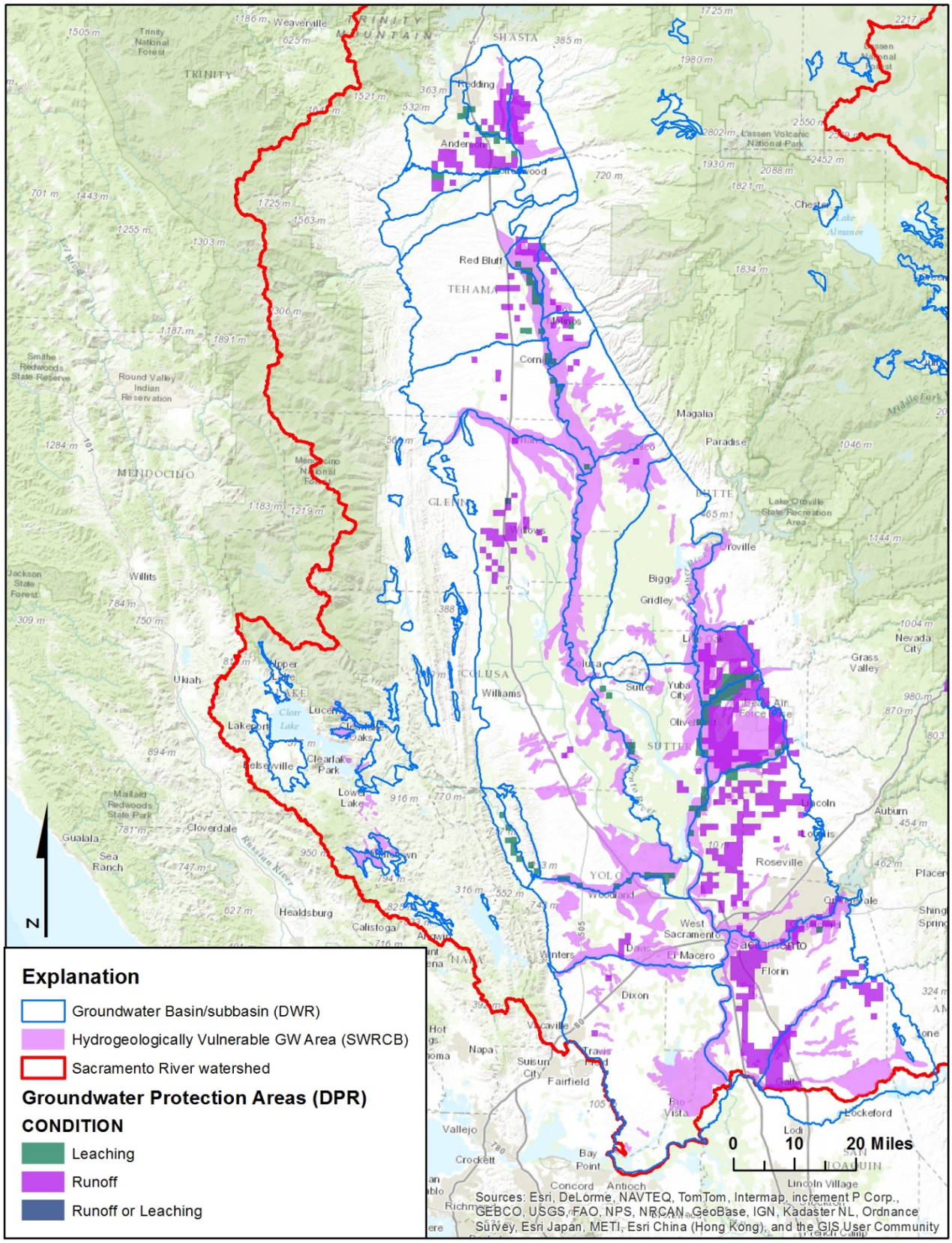
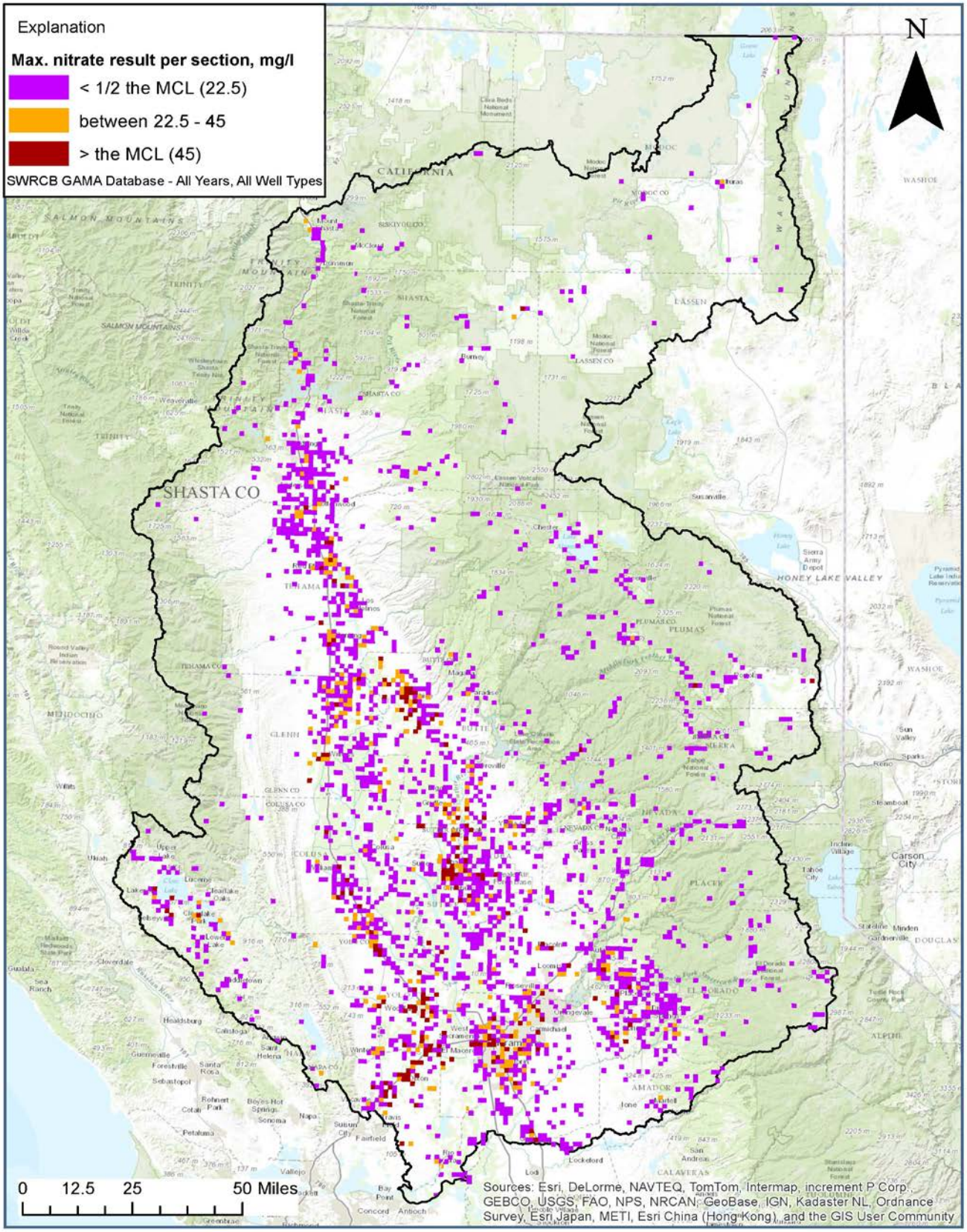


Figure 7. Maximum Nitrate Concentrations per Square Mile Section of Land for Samples with Nitrate Detections. GAMA Database, 1978-2011.



CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
CENTRAL VALLEY REGION

ORDER R5-2014-0030-06
ATTACHMENT B TO ORDER R5-2014-0030-06
MONITORING AND REPORTING PROGRAM

WASTE DISCHARGE REQUIREMENTS GENERAL ORDER
FOR
GROWERS WITHIN THE SACRAMENTO RIVER WATERSHED
THAT ARE MEMBERS OF A THIRD-PARTY GROUP

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Appendix MRP-1: Third-Party Management Plan Requirements

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

Appendix MRP-3: Representative Monitoring Sites and Subwatershed Drainages

I. Introduction

This Monitoring and Reporting Program (MRP) is issued pursuant to 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 entity assisting individual irrigated lands operators or owners that are members of the third-party (Members), as well as requirements for individual Members subject to and enrolled under Waste Discharge Requirements General Order for Growers within the Sacramento River Watershed that are Members of the Third-Party Group, Order R5-2014-0030-06 (hereafter referred to as the "Order"). This MRP applies to each third-party issued an NOA by the Executive Officer. The requirements of this MRP are necessary to monitor Member compliance with the provisions of the Order and determine whether state waters receiving discharges from Member parcels 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 groundwater monitoring, reporting, and electronic data deliverable requirements for the third-party. Due to the nature of irrigated agricultural operations, monitoring requirements for surface waters and groundwater will be periodically reassessed to determine if changes should be made to better represent irrigated agriculture 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 third-party 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 a third-party or all third-parties 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 a third-party or all third-parties governed by the Order.

II. General Provisions

This Monitoring and Reporting Program conforms to the goals of the Nonpoint 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 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 third-party must follow sampling and analytical procedures as specified in Attachment C, Order No. R5-2008-0005, Coalition Group Monitoring Program Quality Assurance Project Plan Guidelines (QAPP Guidelines) and any revisions thereto approved by the Executive Officer[1].

To the extent feasible, all technical reports required by this MRP must be submitted electronically

[1] Central Valley Water Board staff will circulate proposed revisions of the QAPP Guidelines for public review and comment prior to Executive Officer consideration for approval.

in a format specified by the Central Valley Water Board that is reasonably available to the third-party.

This MRP requires the third-party to collect information from its Members and allows the third-party to report the information to the board in a summary format. The third-party must submit specific Member information collected as part of the Order and this MRP when requested by the Executive Officer or as specified in the Order.

This MRP Order became effective on 12 March 2014. The Central Valley Water Board Executive Officer may revise this MRP as necessary. Upon the Executive Officer issuing the Notice of Applicability to the third-party, the third-party, on behalf of the individual Members, shall implement the following monitoring and reporting.

III. Surface Water Quality Monitoring Requirements

The surface water quality monitoring and reporting requirements in the MRP have been developed in consideration of the critical questions identified in the Information Sheet (Attachment A, section VI.A.1). The third-party must collect sufficient data to describe irrigated agriculture's impacts on surface water quality and to determine whether existing or newly implemented management practices comply with the surface water receiving water limitations of the Order.

The third-party may elect to participate in an Executive Officer approved Regional Monitoring Program (RMP) [such as the Delta RMP]. If the third-party elects to participate in a RMP, the third-party may submit a proposal to the Executive Officer for approval to reduce some elements of the surface water monitoring requirements described below and instead provide funding and/or in-kind support to an approved RMP. Participation in a Regional Monitoring Program by a third-party shall consist of providing funds and/or in-kind services to the Regional Monitoring Program at least equivalent to discontinued individual monitoring and study efforts. Written approval of the third-party's request, by the Executive Officer, is required prior to discontinuing any monitoring. Approval by the Executive Officer is not required prior to participating in a Regional Monitoring Program.

If the third-party participates in an Executive Officer approved Regional Monitoring Program in lieu of conducting individual surface water monitoring, the third-party shall continue to participate in the Regional Monitoring Program until such time as the third-party informs the Board that participation in the Regional Monitoring Program will cease and the monitoring prior to approved reductions is reinstituted. Executive Officer approved reduced monitoring may continue so long as the third-party adequately supports the Regional Monitoring Program. If the Discharger fails to adequately support the Regional Monitoring Program, as defined by the Regional Monitoring Program, the third-party shall reinstitute monitoring required prior to approved reductions upon written notice from the Executive Officer

A. Surface Water Monitoring Sites

There are three types of monitoring sites described below: 1) Representative sites; 2) Integration sites; and 3) Special Project sites. Representative sites are monitored comprehensively on a recurring basis to track trends in surface water quality and to identify water quality problems. Integration sites are monitored comprehensively, four times every year to assess broad long term trends. Special Project sites are identified and monitored to investigate identified water quality problems. Special project sites may be selected and used for source identifications or evaluations, confirming whether problems identified at Representative sites occur in represented

drainages, or evaluating effectiveness of implemented management practices. A Representative or Integration site may also be a Special Project site.

1. Representative Site Monitoring

The third-party shall ensure that Representative monitoring sites are representative of all areas and all types of irrigated agricultural waste discharge within the entire third-party area. Surface water monitoring sites shall be located to characterize water flow, quality, and irrigated agricultural waste discharges within the entire third-party area. At a minimum, assessment monitoring (as described in section III.C.1) within each subwatershed shall be conducted at the designated Representative sites (see Table 1) for two consecutive years, followed by two consecutive years of monitoring consisting only of that required for surface water quality management plans (SQMP) or other Special Project monitoring. Exceptions to this monitoring schedule are allowed if a different approach has been required or approved by the Executive Officer (see section III.C.1). If a water quality objective or Trigger Limit is exceeded only once at a monitored Representative site during the two-year assessment period, the parameter associated with the exceedance must be monitored for a third consecutive year[2]. Appendix MRP-3 provides an itemization of the drainages without a monitoring site by subwatershed, as well as their accompanying Representative monitoring site(s). Any SQMP actions associated with the Representative site must also take place in the represented drainages.

2. Integration Site Monitoring

Three sites previously monitored by the Sacramento Valley Water Quality Coalition represent very large and diverse drainages, which are most suitable for identifying cumulative effects and long-term trends in water quality, and will be used as “Integration sites” (Table 1). Monitoring at these locations will be used to identify cumulative effects and long-term trends of agricultural drainage in the Sacramento River Watershed. The parameters monitored will be determined following the process described below in section III.C.3. Integration site monitoring will be conducted four times annually on an ongoing basis, twice following separate storm events in the rainy season and twice during irrigation season at times targeted to early and late in the irrigation season.

3. Special Project Sites

In addition to Representative and Integration sites, the third-party may designate additional Special Project sites as needed in a surface water quality management plan (SQMP) to evaluate commodity or management practice-specific effects on identified water quality problems,[3] to evaluate sources of identified water quality problems, and to monitor continuing status of identified water quality problems.

In accordance with Water Code section 13267, the Executive Officer may require the third-party to conduct local or site-specific monitoring to address a parameter associated with a management plan or TMDL (see section III.C.5. below). Representative sites located in areas where management plans are required will also be considered Special Project sites for the parameter(s) subject to the management plan(s).

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[2] If two exceedances have occurred within the two years the Representative site is being monitored, a third year of monitoring is not required. However, the parameter would need to be monitored in accordance with the Management Plan for that parameter and site.

[3] “Water quality problem” is defined in Attachment E.

B. Monitoring Locations

The location of Representative, Integration and existing Special Project sites are identified in Table 1, below. The monitoring data collected through Representative site monitoring shall be considered representative of conditions in the drainages that are represented (Appendix MRP-3). When action(s) must be taken based on exceedances at the representative sites, such as management practice implementation, the same action(s) shall be taken throughout the irrigated lands being represented by the identified Representative sites.

Table 1. Sacramento Valley Water Quality Coalition Monitoring Sites

Site Identification	Site Code	Type*	Latitude	Longitude
Butte-Yuba-Sutter Subwatershed				
Lower Honcut Creek	LHNCT	REP	39.3092 N	-121.5954 W
Lower Snake River at Nuestro Road	LSNKR	REP	39.1853 N	-121.7036 W
Pine Creek at Highway 32	PNCHY	REP	39.7533 N	-121.9712 W
Butte Slough at Pass Road	BTTSL	SP	39.1873 N	-121.9085 W
Gilsizer Slough at George Washington Rd	GILSL	SP	39.0090 N	-121.6716 W
Wadsworth Canal at South Butte Road	WADCN	SP	39.1534 N	-121.7344 W
Colusa-Glenn Subwatershed				
Freshwater Creek at Gibson Road	FRSHC	REP	39.1748 N	-122.2265 W
Walker Creek near 99W and CR33	WLKCH	REP	39.6242 N	-122.1965 W
Butte Creek at Gridley Road Bridge	BUCGR	SP	39.3619 N	-121.8927 W
Logan Creek at 4 Mile-Excelsior Road	LGNCR	SP	39.3653 N	-122.1161 W
Lurline Creek at 99W	LRLNC	SP	39.2190 N	-122.2461 W
Rough and Ready Pumping Plant (Rd 108)	RARPP	SP	38.8621 N	-121.7927 W
Stone Corral Creek near Maxwell Road	SCCMR	SP	39.2751 N	-122.1043 W
Stony Creek on Hwy 45 near Road 24	STYHY	SP	39.7101 N	-122.0040 W
El Dorado Subwatershed				
North Canyon Creek	NRTCN	REP	38.7604 N	-120.7102 W
Lake Subwatershed				
Middle Creek upstream from Highway 20	MDLCR	REP	39.1764 N	-122.9130 W
McGaugh Slough at Finley Road East	MGSLU	SP	39.0042 N	-122.8623 W
Napa Subwatershed				
Pope Creek us from Lake Berryessa	PCULB	REP	38.6464 N	-122.3642 W
Pit River Subwatershed				
Pit River at Pittville	PRPIT	REP	41.0454 N	-121.3317 W
Pit River at Canby Bridge	PRCAN	SP	41.4017 N	-120.9310 W
Fall River at Fall River Ranch Bridge	FRRRB	SP	41.0351 N	-121.4864 W
Placer-Nevada-South Sutter-North Sacramento Subwatershed				
Coon Creek at Brewer Road	CCBRW	REP	38.9340 N	-121.4518 W
Coon Creek at Striplin Road	CCSTR	SP	38.8661 N	-121.5803 W
Sacramento-Amador Subwatershed				
Cosumnes River at Twin Cities Road	CRTWN	REP	38.2910 N	-121.3804 W

Table 1. Sacramento Valley Water Quality Coalition Monitoring Sites

Site Identification	Site Code	Type*	Latitude	Longitude
Grand Island Drain near Leary Road	GIDLR	REP	38.2399 N	-121.5649 W
Dry Creek at Alta Mesa Road	DCGLT	SP	38.2480 N	-121.2260 W
Laguna Creek at Alta Mesa Road	LAGAM	SP	38.3110 N	-121.2263 W
Shasta-Tehama Subwatershed				
Anderson Creek at Ash Creek Road	ACACR	REP	40.4180 N	-122.2136 W
Burch Creek west of Rawson Road	BRCRR	SP	39.9254 N	-122.2182 W
Coyote Creek at Tyler Road	COYTR	SP	40.0926 N	-122.1590 W
Dixon/Solano Subwatershed				
Ulatis Creek at Brown Road	UCBRD	REP	38.3070 N	-121.7940 W
Z Drain	ZDDIX	SP	38.4522 N	-121.6752 W
Upper Feather River Subwatershed Monitoring Sites				
Middle Fk Feather River above Grizzly Ck	MFFGR	REP	39.8160 N	-120.4260 W
Spanish Creek below Greenhorn Creek	SPGRN	SP	39.9735 N	-120.9103 W
Indian Creek below Arlington Bridge	INDAP	SP	40.0846 N	-120.9161 W
Yolo Subwatershed				
Willow Slough Bypass at Pole Line	WLSPL	REP	38.5902 N	-121.7306 W
Cache Creek at Capay Diversion Dam	CCCPY	SP	38.7137 N	-122.0851 W
Tule Canal at I-80	TCHWY	SP	38.5728 N	-121.5827 W
Integration and Trend Sites				
Sacramento Slough Bridge near Karnak	SSKNK	INT	38.7850 N	-121.6533 W
Colusa Basin Drain above Knights Landing	COLDR	INT	38.8121 N	-121.7741 W
Shag Slough at Liberty Island Bridge	SSLIB	INT	38.3068 N	-121.6934 W

* REP = Representative monitoring sites; INT = integration and trend monitoring sites; SP = special project monitoring sites

C. Monitoring Requirements and Schedule

1. Surface Water Monitoring

Surface water monitoring must provide sufficient data to describe irrigated agriculture's impacts on surface water quality, determine effectiveness of existing or newly implemented management practices, determine whether waste discharges from all represented types of irrigated agricultural operations comply with the receiving water limitations of the Order, and track any trends in degradation. Surface water assessment monitoring shall include a comprehensive suite of constituents (also referred to as "parameters") monitored periodically in a manner that allows for an evaluation of the condition of a water body and determination of whether irrigated agriculture operations in the Sacramento River Watershed are causing or contributing to any surface water quality problems.

Assessment monitoring shall occur at accessible Representative sites, when water is present, for general water quality parameters, nutrients, pathogen indicators, water column and sediment toxicity, pesticides, and metals identified in section III.C.3. The third party shall conduct appropriate monitoring when implementing an applicable Total Maximum Daily Load (TMDL). By

1 August of the calendar year in which monitoring begins, the third-party shall identify a specific set of monitoring parameters (Monitoring Plan Update) for each site that is scheduled to be monitored (see section III.C.3 below).[4] The third-party shall continue monitoring as described in the Sacramento Valley Water Quality Coalition's December 2009 Monitoring and Reporting Program (R5-2009-0875), and as revised by the Executive Officer, until the Monitoring Plan Update has been approved. If there are no proposed or required changes to the existing Monitoring Program Plan or Monitoring Plan Update, the third-party is required to submit notification that no changes are being instituted and is not required to submit the Monitoring Plan Update. According to the 2009 Monitoring and Reporting Program, 2014 is an assessment monitoring year. Therefore, 2015 will be the second assessment year of the schedule specified in MRP Order R5-2014-0030-06.

a. Reduced Monitoring/Management Practices Verification Option

The third-party may propose to use the reduced monitoring/management practices verification option within a subwatershed (or regions within a subwatershed) that is deemed to have a lower potential for surface water quality impacts from irrigated agricultural discharges. A proposal must be submitted to the Executive Officer and approved prior to implementation of this option.

The Executive Officer may approve the reduced monitoring/management practices verification option if the following conditions are met as documented in the proposal submitted by the third-party:

- There is a low threat of pesticide discharges from irrigated lands causing or contributing to a surface water quality exceedance or trend of degradation.
- The parameters associated with any existing management plans in the subwatershed do not include toxicity, pesticides, copper, or nutrients.
- There is a low intensity of agricultural land use in the subwatershed.

At a minimum, the proposal should include the following elements:

- A description of the low threat of pesticide discharges, evaluated based on information such as the types of pesticides applied and their toxicity to aquatic life and human health; the relative amount of pesticide applied (considered by pounds or acres applied); the crops to which the pesticides are applied; and the timing of application.
- A description of the intensity of agricultural land use based on an evaluation of the types of agricultural crops/operations and the proportion of agricultural land use in the watershed.
- A summary of previous monitoring results that confirms a low threat to surface water quality and potential risks to water quality from irrigated agriculture.
- A description of the management practices that may be employed to prevent impacts to water quality and the extent to which those practices are being implemented, if known.
- A description of the education and outreach strategy that will promote the implementation and maintenance of appropriate management.
- A discussion of the strategy for verifying Member implementation of management practices that are protective of surface water quality. The strategy must provide for field

[4] A monitoring year is defined according to water year, which is 1 October through 30 September.

verification of at least 5% of the irrigated acreage annually, on average.

A separate description must be provided for each defined area.

Upon approval of the modified monitoring approach, the third-party shall conduct assessment monitoring at approved Representative sites in the subwatershed area(s) once in every five (5) years. An exceedance of any pesticide, toxicity, copper, or nutrient water quality objective or trigger limit will require monitoring of that constituent for an additional two years. In addition, the third-party must receive Executive Officer approval for the continuation of this option for the subwatershed where the exceedance occurred. Any Special Project monitoring required for management plans or TMDLs for lower priority parameters (i.e., not toxicity, copper, pesticides, or nutrients) must continue. During the same year as assessment monitoring, Farm Evaluation survey information must also be collected from Members and reported as required in the Annual Monitoring Report. In each Annual Monitoring Report, the third-party must report on the implementation of the education and outreach strategy and the management practice verification strategy.

The modified monitoring approach will be in effect for five years from the approval date. The third-party may request that the Executive Officer approve renewal of this option for another five-year period for all or some of the designated areas. The Executive Officer's consideration of approval of renewal will be based on whether the conditions for the original approval are still met. The third-party may include an evaluation of the changes in conditions as a separate report or as part of the AMR submitted following the fourth year of implementation of this option. In its evaluation, the third-party shall include a review of trends in cropping patterns; changes in pesticide use; changes in enrolled Members; and trends in the proportion of agricultural land use in the subwatershed.

b. Follow-up Sampling

The Central Valley Water Board Executive Officer may request that a parameter(s) of concern continue to be monitored at a specific Representative or Special Project site during non-scheduled years. Parameters of concern may include, but are not limited to, parameters that exceed an adopted water quality objective or water quality trigger (see section VIII).

c. Storm Sampling

Sampling events shall be scheduled to capture at least two storm runoff events per year, except where a different frequency has been required or approved by the Executive Officer. As part of the Monitoring Plan Update, the third-party shall identify storm runoff monitoring criteria that are based on, but not limited to, precipitation levels and knowledge of soils or other factors affecting when storm runoff is expected to occur at monitoring sites.

The third-party shall identify a schedule for conducting monitoring during the storm season (approximately October through March) to ensure the collection of the required storm samples when, and if, storm runoff occurs. Any needed adaptability in the proposed scheduled should be described. Completeness and compliance will be assessed based on conducting the total number of required sample events per the approved Monitoring Plan Update.

2. Monitoring Schedule and Frequency

The third-party shall identify the appropriate assessment monitoring periods (e.g., months, seasons) for the parameters that require testing (Table 2), including a discussion of the rationale to support the proposed schedule.

For metals, pesticides, and aquatic toxicity, the monitoring periods shall be determined utilizing previous monitoring results, knowledge of agricultural use patterns (if applicable), pesticide use trends, chemical characteristics, and other applicable criteria. All other required parameters shall be monitored according to an approved schedule and frequency during the years in which monitoring is conducted at the Representative and Integration sites.

Monitoring must be conducted when the pollutant is most likely to be present. If there is a temporal or seasonal component to the beneficial use, monitoring must also be conducted when beneficial use impacts could occur. The frequency of data collection must be sufficient to allow determination of compliance with the relevant numeric water quality objective(s) or water quality triggers. Adequate characterization of the presence of some pollutants may require monitoring more than once per month. The third-party may submit written requests for the removal or addition of monitoring sites or parameters, or to modify the monitoring schedule and frequency, for approval by the Executive Officer.

3. Monitoring Parameters

Water quality and flow monitoring shall be used to assess the wastes in discharges from irrigated lands to surface waters and to evaluate the effectiveness of implemented management practices. Water quality is evaluated with both field-measured parameters and laboratory analytical data as listed in Table 2 of this MRP.

The pesticides marked as “to be determined” (TBD) in Table 2 shall be identified as part of a process by Water Board staff that includes input from qualified scientists and coordination with the Department of Pesticide Regulation. Based on the evaluation factors identified in this process, the Executive Officer will provide the third-party with a list of pesticides[5] that may require monitoring in areas where they are applied and have the potential to impair water quality. The third-party shall apply the evaluation factors to the relevant conditions in each sub-watershed and propose the pesticides to be monitored in its Monitoring Plan Update.

Parameters that are part of an adopted TMDL that is in effect and for which irrigated agriculture is a source within the Sacramento River Watershed shall be monitored in accordance with the adopted Basin Plan provisions or as directed by the Executive Officer. Current adopted TMDLs within the Sacramento River Watershed for which irrigated agriculture is a potential or confirmed source include the Clear Lake nutrient TMDL, and Delta methyl mercury TMDL.

The metals to be monitored at sites within each subwatershed shall be determined through an evaluation of several factors. The evaluation will provide the basis for including or excluding each metal. Evaluation factors shall include, but not be limited to: documented use of the metal applied to lands for irrigated agricultural purposes in the last three years; prior monitoring results; geological or hydrological conditions; and mobilization or concentration by irrigated agricultural operations. The third-party may also consider other factors such as acute and chronic toxicity thresholds and chemical characteristics of the metals. The third-party shall evaluate the monitoring parameters listed in Table 2 to determine which metals and metal fractions warrant

[5] 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.

monitoring for each subwatershed. Documentation of the evaluations must be provided to the Central Valley Water Board as part of the Monitoring Plan Update.

The third-party shall identify in the Monitoring Plan Update all parameters to be monitored and the proposed monitoring periods and frequency at selected sites by 1 August of the year in which monitoring begins (monitoring period begins 1 October). If there are no changes from the previous Executive Officer approved monitoring (i.e., previously approved Monitoring Plan Update), the third-party is only required to send written notification that there are no changes and is not required to submit a Monitoring Plan Update. The Monitoring Plan Update shall be subject to Executive Officer review and approval prior to the initiation of changes in monitoring activities.

Table 2. Monitoring Parameters

	Measured Parameter	Matrix	Required
Field Measurements	Estimated Flow (cfs)	Water	x
	Photo Documentation	Site	x
	Conductivity (at 25 ºC) (µs/cm)	Water	x
	Temperature (ºC)	Water	x
	pH	Water	x
	Dissolved Oxygen (mg/L)	Water	x
Drinking Water	*E. coli*	Water	x
	Total Organic Carbon (TOC)	Water	x
General Physical	Hardness (as $CaCO_3$)	Water	TBD
	Total Suspended Solids (TSS)	Water	x
	Turbidity	Water	x
Metals	Arsenic (total)	Water	TBD
	Boron (total)	Water	TBD
	Cadmium (total and dissolved)**	Water	TBD
	Copper (total and dissolved)**	Water	TBD
	Lead (total and dissolved)**	Water	TBD
	Molybdenum (total)	Water	TBD
	Nickel (total and dissolved)**	Water	TBD
	Selenium (total)	Water	TBD
	Zinc (total and dissolved)**	Water	TBD
Nutrients	Total Ammonia (as N)	Water	x
	Unionized Ammonia (calc value)	Water	x
	Nitrogen, Nitrate+Nitrite	Water	x
	Soluble Orthophosphate	Water	x
Pesticides	Registered pesticides and degradates determined according to the process identified in section III.C.3.	Water	TBD

	Measured Parameter	Matrix	Required
303(d)	TMDL constituents required by the Basin Plan 303(d) listed constituents to be monitored if irrigated agriculture is identified as a contributing source within the Sacramento River Watershed and requested by the Executive Officer.	Water or Sediment	TBD
Water Toxicity	*Ceriodaphnia dubia*	Water	x
	Pimephales promelas	Water	x
	Selenastrum capricornutum	Water	x
	Toxicity Identification Evaluation	Water	see section III.C.4
Sediment Toxicity	*Hyalella azteca*	Sediment	x
Pesticides & Sediment Parameters	Bifenthrin	Sediment	As needed***
	Cyfluthrin	Sediment	As needed***
	Cypermethrin	Sediment	As needed***
	Deltamethrin	Sediment	As needed***
	Esfenvalerate/Fenvalerate	Sediment	As needed***
	Fenpropathrin	Sediment	As needed***
	Lambda cyhalothrin	Sediment	As needed***
	Permethrin	Sediment	As needed***
	Piperonyl butoxide (PBO)	Sediment	As needed***
	Chlorpyrifos	Sediment	As needed***
	Total Organic Carbon	Sediment	As needed***
	Grain Size	Sediment	x

** Hardness samples shall be collected when sampling for these metals.

*** For sediment samples measuring significant toxicity and < 80% organism survival compared to the control, the sediment pesticide analysis will be performed. Sediment pesticide analyses may be identified according to an evaluation of PUR data (see sediment toxicity testing requirements in section III.C.4 below).

4. Toxicity Testing Procedures

The purpose of the toxicity testing is to: 1) evaluate compliance with the Basin Plan narrative toxicity water quality objective; 2) identify the causes of toxicity when and where it is observed (e.g., metals, pesticides, ammonia, etc.); and 3) evaluate any additive toxicity or synergistic effects due to the presence of multiple constituents.

a. Aquatic Toxicity

Aquatic toxicity testing shall include *Ceriodaphnia dubia* (water flea) and *Selenastrum capricornutum* (green alga) in the water column during each year of Assessment monitoring.

Pimephales promelas toxicity shall be monitored during the first year of the assessment monitoring period, and must be monitored in the second year of assessment monitoring at sites where significant toxicity with *Pimephales* survival of ≤90% of controls is observed in the first year. Testing for *C. dubia* and *P. promelas* shall follow the USEPA acute toxicity testing methods[6]. Testing for *S.capricornutum* shall follow the USEPA short-term chronic toxicity testing methods[7], Toxicity test endpoints are survival for C. dubia and P. promelas, and growth for S. capricornutum..

Water column toxicity analyses shall be conducted on 100% (undiluted) sample for the initial screening. A sufficient sample volume shall be collected in order to allow the laboratory to conduct a Phase I Toxicity Identification Evaluation (TIE) on the same sample, should toxicity be detected, in an effort to identify the cause of the toxicity.

If a 50% or greater difference in *Ceriodaphnia dubia* or *Pimephales promelas* mortality in an ambient sample, as compared to the laboratory control, is detected at any time in an acceptable test, a TIE shall be initiated within 48 hours of such detection. If a 50% or greater reduction in *Selenastrum capricornutum* growth in an ambient sample, as compared to the laboratory control, is detected at the end of an acceptable test, a TIE shall be initiated within 48 hours of such detection.

At a minimum, Phase I TIE[8] manipulations shall be conducted to determine the general class(es) (e.g., metals, non-polar organics, and polar organics) of the chemical(s) causing toxicity. The laboratory report of TIE results submitted to the Central Valley Water Board must include a detailed description of the specific TIE manipulations that were utilized.

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 in order to quantify the magnitude of the toxic response. For the fathead minnow 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.

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 prior to test initiation and 2 hours prior to test renewal shall be applied. Test solution renewal must be 100% renewal for *Ceriodaphnia 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 EDTA is to ensure that metals used to control vegetation in the field are

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[6] 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-821-R-02-012.

[7] 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.

[8] USEPA. 1991. Methods for Aquatic Toxicity Identification Evaluations. Phase I Toxicity Characterization Procedures. Office of Research and Development, Washington DC 20460. EPA-600-6-91-003.

not removed from sample aliquots prior to analysis or during the initial screening.

a. Sediment Toxicity

Sediment toxicity analyses shall be conducted according to EPA Method 600/R-99/064. 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 third-party for water quality assessment monitoring, if appropriate sediment (i.e., silt, clay) is present at the site. If 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 twice per year when water is present. Attempts should be made to collect one sample between 15 August and 15 October, and one sample collected between 1 March and 30 April, during each year of Assessment monitoring for the monitoring site. The *H. azteca* sediment toxicity test endpoint is survival. The Executive Officer may request different sediment sample collection timing and frequency under a SQMP. The third-party may submit written requests to modify the monitoring schedule and frequency of sediment toxicity testing for approval by the Executive Officer.

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. Note that 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 statistically significant toxicity to *Hyalella azteca* at the end of an acceptable test *and* that exhibit < 80% organism survival compared to the control will require pesticide analysis of the same sample in an effort to determine the potential cause of toxicity. The third-party may use the previous three years of available pesticide use information to determine which of the parameters listed in Table 2 require testing in the sediment 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 third-party may also choose to follow up with sediment TIE procedures (USEPA 2007) when there is ≥ 50% reduction in test organism mortality as compared to the laboratory control. Sediment TIEs are an optional tool that may be used to determine possible causes of toxicity. When sediment samples are collected for toxicity analysis, additional sample volume sufficient for the required chemical and physical follow-up analyses must be collected.

5. Special Project Monitoring

The Central Valley Water Board or Executive Officer may require the third-party to conduct local or site-specific monitoring where monitoring identifies a water quality problem (Special Project Monitoring). Special project monitoring may include, but is not limited to, specific targeted monitoring or studies to address implementation of a TMDL or implementation of a Management Plan that results from exceedances. The studies shall be designed to evaluate the effects of changes in management practices on water quality for the parameters of concern. Once Special Project Monitoring is required, the third-party must submit a Special Project Monitoring proposal or implement a previously approved Special Project Monitoring proposal as directed by the Executive Officer. The proposal must provide the justification for the proposed study design,

specifically identifying how the study design will quantify irrigated agriculture's 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 commodity and management practice specific field studies for those commodities and irrigated agricultural practices that could be associated with the constituents of concern. Special Project Monitoring studies will be designed to evaluate the effectiveness of practices used by multiple Members and will not be required of the third-party to evaluate compliance of an individual Member.

Based on previous monitoring results through 2012, the Sacramento Valley Water Quality Coalition has identified locations where Management Plans are currently required. These are identified as SP (special project) sites in Table 1. Appendix MRP-1 describes requirements for all Management Plans.

Special project monitoring constituents, frequency or other elements shall be reviewed with Central Valley Water Board staff at least annually and may be revised over time. Revisions of monitoring sites, constituents, schedule, and other elements for Management Plans that are approved by the Executive Officer will then supersede those in prior Management Plans.

D. 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 third-party shall ensure that the most current version of the templates are being utilized and that updates to database lookup lists are communicated to the ILRP on a routine basis. 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 third-party shall maintain an electronic version of its approved Quality Assurance Project Plan (eQAPP). Detailed electronic water quality data submittal requirements are provided in section V.A of this MRP Order. Note that electronic (e.g. PDF) copies 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 third-party's eQAPP. The third-party will be notified of any changes made to the dataset in order to successfully load the data. If significant changes are found to be needed, the dataset will be returned to the third-party 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 third-party 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 third-party 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 third-party 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 third-party'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 each third-party with an eQAPP associated with their previously approved QAPP. The third-party 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 do 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 third-party. 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 third-party 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 prior to 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 are 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 third-party must collect and analyze sufficient data to describe irrigated agricultural impacts on groundwater quality and to determine whether existing or newly implemented management practices comply with the groundwater receiving water limitations of the Order.

The strategy for evaluating groundwater quality and protection consists of (1) Drinking Water Supply Well Monitoring, (2) Groundwater Quality Assessment Report, (3) Management Practices Evaluation Program, and (4) Groundwater Quality Trend Monitoring Program.

1. Drinking Water Supply Well Monitoring is designed to identify human health impacts of nitrate contamination and notify well users of any well contaminations of nitrate above the Maximum Contaminant Level (MCL) for drinking water wells located on agricultural property.
2. 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.
3. The overall goal of the Management Practice Evaluation Program (MPEP) is to evaluate the effectiveness of management practices in limiting the discharge of waste from irrigated lands to groundwater under different conditions (e.g., soil type, depth to groundwater, irrigation practice, crop type, nutrient management practice).

4. The overall objectives of the Groundwater Quality Trend Monitoring Program are to determine current water quality conditions of groundwater relevant to irrigated agriculture and develop long-term groundwater quality information that can be used to evaluate the regional effects of irrigated agricultural practices.

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 of irrigated agriculture are protective of groundwater quality, the Executive Officer may also, pursuant to Water Code section 13267, order Members to perform additional monitoring or evaluations, where violations of this Order are documented or the irrigated agricultural operation is found to be a significant threat to groundwater quality.

A. Drinking Water Supply Well Monitoring

After 1 January 2022, Members must initiate sampling of all private drinking water supply wells located on their property, as described below. The requirements of this section will not take effect if, prior to 1 January 2022, the State Water Board determines that the legislature has established a comprehensive statewide program that assures that private drinking water wells will be routinely monitored for nitrate contamination and users of those wells will be notified of the results.

The purpose of Drinking Water Supply Well Monitoring is to identify drinking water supply wells that have nitrate concentrations exceeding the MCL and notify any well users of the potential for human health impact.

1. Members must conduct annual drinking water supply well sampling. Members may submit one or more annual drinking water supply well sampling results from one or more of the five prior years in lieu of one or more of the first three rounds of annual monitoring samples, provided sampling and testing for nitrates was completed using EPA approved methods and by an Environmental Laboratory Accreditation Program certified laboratory. If the nitrate concentration is below 8 mg/L nitrate + nitrite as N in three consecutive annual samples, Members may conduct sampling every five years going forward. An alternative sampling schedule based on trending data for the well may be required by the Executive Officer at any time. Sampling may cease if a drinking water well is taken out of service or no longer provides drinking water, including where the well is taken out of service because sufficient replacement water is being supplied. The Members must keep any records (e.g. photos, bottled water receipts) establishing that the well is not used for drinking water.
2. Groundwater samples must be collected using proper sampling methods, chain-of-custody, and quality assurance/quality control protocols. Groundwater samples must be collected at or near the well head before the pressure tank and prior to any well head treatment. In cases where this is not possible, the water sample must be collected from a sampling point as close to the pressure tank as possible, or from a cold-water spigot located before any filters or water treatment systems.
3. Laboratory analyses for groundwater samples must be conducted by an Environmental Laboratory Accreditation Program State certified laboratory according to the U.S. EPA approved methods; unless otherwise noted, all monitoring, sample preservation, and analyses must be performed in accordance with the latest edition of *Test Methods for Evaluating Solid Waste*, SW-846, United States Environmental Protection Agency, and analyzed as specified

herein by the above analytical methods and reporting limits indicated. Certified laboratories can be found at the web link: www.waterboards.ca.gov\elap.

4. All drinking water supply well monitoring data, including any existing data, are to be submitted electronically to the State Water Board's GeoTracker Database by the testing laboratory. The data submitted shall include the APN where the drinking water supply well is located.
5. If groundwater monitoring determines that water in any well that is used for or may be used for drinking water exceeds 10mg/L of nitrate + nitrite as N, the Member must provide notice to the users within 10 days of learning of the exceedance and send copy of the notice to the Central Valley Water Board. If the Member is not the owner of the irrigated lands, the Member may provide notice instead to the owner within 24 hours of learning of the exceedance, and the owner must provide notice to the users within nine days and send a copy of the notice to the Central Valley Water Board.
6. Notice shall be given to users by providing them a copy of a Drinking Water Notification Template approved by the Executive Officer. The template shall be signed by the Member (or landowner if the member is not the owner) certifying notice has been provided to the users. A copy of the signed template shall be sent to the Central Valley Water Board and retained by the Member or non-Member owner.

B. Groundwater Quality 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. Three (3) months after receiving an NOA from the Central Valley Water Board, the third-party will provide a proposed outline of the GAR to the Executive Officer that describes data sources and references that will be considered in developing the GAR. The third-party must review and update the GAR to incorporate new information every five (5) years after Executive Officer approval of the GAR.

1. *Objectives.* The main objectives of the GAR are to:
   - Provide an assessment of all readily 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.
   - Establish priorities for implementation of monitoring and associated studies within high vulnerability or data gap areas.
   - Provide a basis for establishing Monitoring Workplans developed to assess groundwater quality trends.
   - Provide a basis for establishing Management Practices Evaluation Program (MPEP) Workplans and priorities developed to evaluate the effectiveness of agricultural management practices to protect groundwater quality.
   - Provide a basis for establishing groundwater quality management plans in high vulnerability areas and priorities for implementation of those plans.

2. *GAR components.* The GAR shall include, at a minimum, the following data components:
   - Detailed land use information with emphasis on land uses associated with irrigated agricultural operations. The information shall identify the largest acreage commodity types in the third-party area, including the most prevalent commodities comprising up to at least 80% of the irrigated agricultural acreage in the third-party area. If the third-party manages the area through sub-watershed groups, the GAR information should be developed for each sub-watershed.

- Information regarding depth to groundwater, provided as a contour map(s), if readily available. Tabulated and/or graphical data from discrete sampling events may be submitted if limited data precludes producing a contour map.
- Groundwater recharge information, if readily available, 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 from existing monitoring networks (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 relevant 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 third-party should assess the possibility of data sharing between the data-collecting entity, the third-party, and the Central Valley Water Board.

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

   - Determine 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.
   - Determine the merit and feasibility of incorporating existing 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 to provide a basis for prioritization of workplan activities.
   - Discuss pertinent geologic and hydrogeologic information for the third-party area(s) and utilize GIS mapping applications, graphics, and tables, as appropriate, in order to clearly convey pertinent data, support data analysis, and show results.

4. *Groundwater vulnerability designations.* The GAR shall designate high/low vulnerability areas for groundwater 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 third-party must review and confirm or modify vulnerability designations every five (5) years after Executive Officer approval of the GAR. The vulnerability designations will be made by the third-party using a combination of physical properties (soil type, depth to groundwater, known agricultural impacts to beneficial uses, etc.) and management practices (e.g., irrigation method, crop type, nitrogen application and removal rates, extent of implementation, etc.). If the third-party intends to develop a Basin Plan Amendment Workplan (as described in section VIII.N of the Order), the third-party must identify the areas where a high vulnerability designation results from exceedances due to

naturally elevated levels of a constituent. The third-party shall provide the rationale for proposed vulnerability determinations. The Executive Officer will make the final determination regarding vulnerability designations.

If the GAR is not submitted to the board by the required deadline, the Executive Officer will designate high/low vulnerability groundwater areas considering such information as 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 irrigated agriculture waste discharges may cause or contribute to the exceedance.

5. *Prioritization of high vulnerability groundwater areas.* The third-party 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 third-party may consider, but not be limited to, the following:

- Identified exceedances of water quality objectives for which irrigated agriculture waste discharges are the cause, or a contributing source.
- The proximity of the high vulnerability area to areas contributing recharge to municipal and domestic supplies where groundwater serves as a significant source of supply.
- Existing field or operational practices identified to be associated with irrigated agriculture waste discharges that are the cause, or a contributing source.
- The largest acreage commodity types comprising up to at least 80% of the irrigated agricultural acreage in the high vulnerability areas and the irrigation and fertilization practices employed by these commodities.
- 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 or other technical references or regional evaluations may also be considered in designating and prioritizing vulnerability areas for groundwater. Such data include, but are not limited to, 1) published scientific studies, 2) hydrogeologic models, 3) data from areas with exceedances of water quality objectives for which irrigated agriculture waste discharges may cause or contribute to the exceedance, 4) those areas that have been identified by the State Water Board as Hydrogeologically Vulnerable Areas, and 5) California Department of Pesticide Regulation groundwater protection areas.

The Executive Officer will review and may approve or require changes to any third-party proposed high/low vulnerability areas and the proposed priority ranking. The vulnerability areas, or any changes thereto, shall not be effective until third-party receipt of written approval by the Executive Officer. An interested person may seek review by the Central Valley Water Board of the Executive Officer's decision on the designation of high and low vulnerability areas associated with approval of the Groundwater Quality Assessment Report.

C. Management Practice Evaluation Program

The Management Practice Evaluation Program (MPEP) shall prioritize the determination of the crop-specific coefficients for conversion of yield to nitrogen removed followed by the determination of acceptable ranges for the multi-year A/R ratio target values by crop. In addition,

the goal of the MPEP is to evaluate the effectiveness of irrigated agricultural practices[9] with regard to groundwater quality. A MPEP may prioritize the condition relevant in high vulnerability groundwater areas and must address the constituents of concern described in the GAR. This section provides the goals, objectives, and minimum reporting requirements for the MPEP. As specified in section IV.E of this MRP, the third-party 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:
   - Determine the crop-specific coefficients for conversion of a measured crop yield to nitrogen removed.
   - Determine acceptable ranges for the multi-year A/R ratios by crop.
   - Identify whether existing site-specific and/or commodity-specific management practices are protective of groundwater quality
   - Determine if newly implemented management practices are improving or may result in improving groundwater quality.
   - Develop a quantitative estimate of the effect of Members' discharges of constituents of concern on groundwater quality.
   - Utilize the results of evaluated management practices to improve the practices implemented on Member farms (not specifically evaluated, but having similar site conditions).

   Given the wide range of management practices/commodities that are used within the third-party's boundaries, it is anticipated that the third-party will rank or prioritize its areas and commodities, and present a phased approach to implement the MPEP. The Third Party may base such prioritization on high/low vulnerability distinctions.

2. *Implementation*. Since management practices evaluation may transcend watershed or third-party 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. The MPEP may be conducted in one of the following ways:

   - By the third-party,
   - By watershed or commodity groups within an area with known groundwater impacts or vulnerability, or
   - By watershed or commodity groups that wish to determine the effects of regional or commodity driven management practices.

   A master schedule describing the rank or priority for the investigation(s) 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 below.

3. *Report.* Reports of the MPEP must be submitted to the Executive Officer as part of the third-party's Monitoring Report or in a separate report due on the same date as the Annual Monitoring Report. The report shall include all data[10] (including analytical reports) collected by

[9] In evaluating management practices, the third-party is expected to focus on those practices that are most relevant to the Members' groundwater quality protection efforts.

[10] The data need not be associated with a specific parcel or Member.

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, including A/R and A-R data. 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 third-party 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 third-party 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 Members of the third-party and staff of the Central Valley Water Board to identify which practices at monitored farms are appropriate for farms with the same or similar range of site conditions, and generally where such farms may be located within the third-party area (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, engineering and agronomic 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 third-party in conjunction with commodity groups and/or other experts (e.g., University of California Cooperative Extension, Natural Resources Conservation Service) shall propose and implement new/alternative/refined management practices to be subsequently evaluated. Where applicable, existing GQMPs shall be updated by the third-party group to be consistent with the findings of the Management Practices Evaluation Report.

D. 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.F of this MRP, the third-party is required to develop a workplan that will describe the methods that will be utilized to meet the trend monitoring requirements. This MRP allows developing and implementing a regional Groundwater Quality Trend Monitoring workplan that involves participants in other areas or third-party groups, provided the regional workplan meets the objectives and sampling and reporting requirements described herein. The third-party must submit a copy of the agreement between the parties included in the regional Groundwater Quality Trend Monitoring Group (Trend Monitoring

Group). Under this option, the regional workplan may propose a phased approach to develop and implement the workplan elements specified in section IV.F of this MRP.

1. *Objectives.* The objectives of Groundwater Quality Trend Monitoring are (1) to determine current water quality conditions of groundwater relevant to irrigated agriculture, 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 irrigated agriculture and its practices.

2. *Implementation.* To reach the stated objectives for the Groundwater Quality Trend Monitoring program, the third-party shall develop a groundwater quality monitoring network that will (1) be implemented over both high and low vulnerability areas in the third-party area; and will (2) employ shallow wells, but not necessarily wells completed in the uppermost zone of first encountered groundwater. The use of existing wells is less costly than installing wells specifically designed for groundwater quality monitoring, while still yielding data which can be compared with historical and future data to evaluate long-term groundwater quality trends. The third-party may also consider using existing monitoring networks such as those used by AB 3030 and SB 1938 plans.

   The third-party, either solely or in conjunction with a regional Groundwater Quality Trend Monitoring Group, shall submit a proposed Groundwater Quality Trend Monitoring Workplan described in section IV.F below to the Central Valley Water Board. The proposed network shall consist of a sufficient number of wells to provide coverage in the third-party geographic area so that current water quality conditions of groundwater and composite regional effects of irrigated agriculture can be assessed according to the trend monitoring objectives. The rationale for the distribution of trend monitoring wells shall be included in the workplan submitted by the third-party. If the third-party participates in a Trend Monitoring Group, the proposed well network and rationale for distribution of trend monitoring wells is not required in the initial workplan. However, the initial workplan must include a schedule for developing and submitting a proposed well network and rationale for distribution of trend monitoring wells.

3. *Reporting.* The results of trend monitoring are to be included in the third-party's Monitoring Report and shall include a map of the sampled wells, tabulation of the analytical data, and time concentration charts. Groundwater quality monitoring data are to be submitted electronically to the State Water Board's GeoTracker Database and 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 third-party or Trend Monitoring Group) from each well, the third-party is to evaluate the data for trends. The methods to be used to evaluate trends shall be proposed by the third-party or Trend Monitoring Group in the Groundwater Quality Trend Monitoring Workplan described in section IV.F below.

E. Management Practices Evaluation Workplan

The third-party, either solely or in conjunction with a Management Practices Evaluation Group (watershed or commodity based), shall prepare a Management Practices Evaluation Workplan. The workplan shall be submitted to the Executive Officer for review and approval. The workplan must identify a reasonable number of evaluation locations. It must also encompass the range of management practices used, the major agricultural commodities, and site conditions under which these commodities are grown. The workplan shall be designed to meet the objectives and minimum requirements described in section IV.C 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 an equivalent method approved by the Executive Officer[11] must be provided. The proposed approach may include:

   - literature review of identified management practices,
   - root zone studies,
   - groundwater monitoring,
   - tracking applied and removed nitrogen,
   - modeling,
   - vadose zone sampling, and/or
   - other scientifically sound and technically justifiable methods for meeting the objectives of the Management Practices Evaluation Program.

   Where available, shallow groundwater quality monitoring data should be collected to validate the conclusions regarding the effect on groundwater quality of the evaluated practices. Any shallow groundwater quality monitoring that is part of the workplan must be of first encountered groundwater. Monitoring of shallow first encountered groundwater more readily 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, and
   - the frequency of the data collection (e.g., root zone pore water, vadose zone monitoring, groundwater quality 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 enable identification of management practices that are protective of water quality at Member farms, including represented farms (i.e., farms for which on-site evaluation of practices is not conducted).

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[11] 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 (see Finding 51).

4. *Master workplan – prioritization.* If the third-party chooses to rank or prioritize areas/commodities in its GAR, a single Management Practices Evaluation Workplan may be prepared which includes a timeline describing the priority and schedule for each of the areas/commodities 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 Workplan, the third-party 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.

6. *Groundwater Protection Formula*: By 1July 2020, the third-party shall amend the workplan to propose a Groundwater Protection Formula (GWP Formula) to the Executive Officer. The purpose of the GWP Formula is to generate a value (the Groundwater Protection Value or GWP Value), expressed as either a nitrogen loading number or a concentration of nitrate in water (e.g. mg/l) as appropriate,[12] reflecting the total applied nitrogen, total removed nitrogen, recharge conditions, and other relevant and scientifically supported variables that influence the potential average concentration of nitrate in water expected to reach groundwater in a given township over a given time period. The Executive Officer shall approve the proposed GWP Formula with any revisions after opportunity for public review and comment. The third-party shall use the GWP Formula to compute GWP Values for each township in high vulnerability areas as part of its GQMP. The GWP Values shall be subject to public review and comment and Executive Officer approval. GWP Values shall be developed and included in the GQMP no later than six months from Executive Officer approval of the GWP Formula.

7. *Groundwater Protection Targets by Township*: The first year following the third-party's inclusion of GWP Values in the GQMP, the third-party shall develop Groundwater Protection Targets (GWP Targets) for each township for which a GWP Values was computed the prior year. The purpose of the GWP Targets is to set a desired target that is intended to achieve compliance with the Receiving Water Limitations for groundwater described in Section III B of the Order within the time schedule for compliance specified in Section XII of the Order. The GWP Targets shall be informed by the GAR, the MPEP, and the groundwater quality trend monitoring program. The GWP Targets shall be reviewed and subject to approval by the Executive Officer after opportunity for public review and comment. The GWP Targets shall be reviewed and revised as necessary every five years.

F. Groundwater Quality Trend Monitoring Workplan

The third-party, either solely or in conjunction with a regional Groundwater Quality Trend Monitoring Group, shall develop a workplan for conducting trend monitoring within its boundaries that meets the objectives and minimum requirements described in section IV.D of this MRP. The workplan shall be submitted to the Executive Officer for review and approval. If the regional Groundwater Quality Trend Monitoring Group option is selected, the workplan must be submitted to the Executive Officer by 31 October 2017. The regional Groundwater Quality Trend Monitoring Workplan may propose a schedule for a phased approach to develop and implement items 1 through 4 below. In addition, the proposed schedule shall include submittal of a QAPP for the

[12] The appropriate metric to be determined as part of the workplan development.

regional Trend Monitoring Workplan. A single third-party Trend Monitoring Workplan shall provide full information/details for items 1 through 4 below upon submittal of the workplan, due one (1) year following approval of the GAR.

1. *Workplan approach.* The Trend Monitoring Workplan must include a discussion of the rationale for the number of proposed wells to be monitored and their locations is required in the workplan. The rationale needs to consider: 1) the variety of agricultural commodities produced within the third-party's boundaries (particularly those commodities comprising the most irrigated agricultural acreage), 2) the conditions discussed/identified in the GAR related to the vulnerability or data gap prioritization within the third-party area, and 3) the areas identified in the GAR as contributing significant recharge to urban and rural communities where groundwater serves as a significant source of supply.

2. *Well details.* The Workplan will provide details for wells proposed 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*. Trend monitoring wells will be sampled, at a minimum, annually at the same time of the year for the indicator parameters identified in Table 3 below.

4. *Workplan implementation and analysis.* The Workplan will describe proposed method(s) to be used to evaluate trends in the groundwater quality monitoring data over time.

Table 3 Monitored parameters at groundwater Trend Monitoring wells

Annual Monitoring Conductivity (at 25 ºC)* (μmhos/cm) pH* in pH units Dissolved oxygen (DO)* (mg/L) Temperature* (ºC) Nitrate as nitrogen (mg/L) * field parameters
Trend monitoring wells are also to be sampled initially and once every five years thereafter for the following COCs: Total dissolved solids (TDS) (mg/L) General minerals (mg/L): Anions (carbonate, bicarbonate, chloride, and sulfate) Cations (boron, calcium, sodium, magnesium, and potassium)

V. Third-Party Reporting Requirements

Reports and notices shall be submitted in accordance with section IX of the Order, Reporting Provisions.

The Third-Party shall develop Anonymous Member IDs and Anonymous APN IDs, as defined in Attachment E, for the reporting of data under section C and D below.

A. Quarterly Submittals of Monitoring Results

Each quarter the third-party shall submit the previous quarter monitoring results in electronic format. The dates of these submittals shall be as listed in Table 4 below.

Table 4 Quarterly Surface Water Monitoring Data Reporting Schedule

Due Date	Type	Reporting Period
1 March	Quarterly Monitoring Data Report	1 July through 30 September of previous calendar year
1 June	Quarterly Monitoring Data Report	1 October through 31 December of previous calendar year
1 September	Quarterly Monitoring Data Report	1 January through 31 March of same calendar year
1 December	Quarterly Monitoring Data Report	1 April through 30 June of same calendar year

Exceptions to due dates for submittal of electronic data may be granted by the Executive Officer if good cause is shown. The Quarterly 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 most recent version of the third-party's approved QAPP Guidelines.
2. The most current version of the third-party'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 quarterly report, 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.

B. Annual Groundwater Monitoring Results

Annually, by 1 May, the third-party shall submit the prior year's groundwater monitoring results as an Excel workbook containing an export of all data records uploaded and/or entered into the State Water Board GeoTracker database. 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. If data are not loaded into the GeoTracker database, this shall also be noted with the submittal.

C. Annual Management Practice Implementation Data

By 30 November 2020, and annually thereafter, the third-party shall submit to the Central Valley Water Board management practice implementation data from the most recently submitted Farm Evaluations in Excel workbook format. By 30 November 2021, and annually thereafter, the third-party shall also submit to the Central Valley Water Board management practice implementation data from the prior year's INMP Summary Reports and from MPIRs in Excel workbook format. 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. The third-party shall maintain an original electronic copy of all Farm Evaluations, INMP Summary Reports, and MPIRs, for ten years as required in Section X of the order.

The following data shall be reported to the Central Valley Water Board for each field:

1. Anonymous Member ID
2. Crop: If the Member has more than one field of a given crop, these may be identified by crop plus a number (e.g. $tomato_1$, $tomato_2$).

Data from the INMP Summary Report

3. Whether Member was notified that Member was an outlier for AR data
4. INMP certification method
5. Irrigation method
6. Irrigation practices
7. Nitrogen management practices

Data from MPIR:

8. Whether the field is in a SQMP area
9. If so, management practices implemented consistent with the SQMP
10. Whether the field is in a GQMP area
11. If so, management practices implemented consistent with the GQMP

Data from Farm Evaluation:

12. Pest management practices
13. Sediment and erosion management practices
14. Whether there are irrigation wells
15. Whether there are abandoned wells

D. Annual Irrigation and Nitrogen Management Plan Summary Report Data

The third-party shall submit certain data from the prior year's Irrigation and Nitrogen Management Plan (INMP) Summary Reports and certain additional calculations in these tables in Excel workbook format. If any INMP Summary Reports or data are missing, the submittal must include a description of what data are missing and when they will be submitted to the Central Valley Water Board.

The third-party shall submit Township AR Data Table beginning 30 November 2019 and annually thereafter.[13]

The third-party shall submit the Individual Field AR data by Anonymous Member ID Table beginning 30 November 2020, and annually thereafter.[14]

The third-party shall submit the Individual Field AR Data by Anonymous APN ID Table beginning 30 November 2021 and annually thereafter. The third-party shall maintain all INMP Summary reports received by the third-party and maintain all electronic database tables created from the INMP Summary Reports for a minimum of 10 years as required by section X of the order.

[13] For the 2019 and 2020 reporting years, the third-party shall utilize Nitrogen Management Plan Summary Report data submitted by Members in accordance with MRP Order R5-2014-0030-05.

[14] We recognize that, if multiple crop types are grown in the same field over the course of a year or over several years, variations on field nomenclature and crop reporting will be necessary. For example, the field could be identified as the same field in an extra column and an extra row could be added for each crop. In addition, the three-year A/R target range would likely need to be expressed as a weighted average of the crops grown during the three years.

Concurrently with the data submission, the third-party shall identify the entries in the two Individual Field AR data tables above that the third-party considers outliers for AR data, subject to follow up actions, and the standard used to make that determination.

The third-party shall calculate the following values and convert them to per acre values as indicated:

Total Nitrogen Removed

The total nitrogen removed shall be calculated from the total amount of material removed (harvested/sequestered) and multiplied by a crop-specific coefficient, C_N. The third-party shall determine, through literature review, nitrogen removed testing, and research, the most appropriate C_N coefficients for converting crop yield to nitrogen removed. The third-party shall publish C_N coefficients for crops that cover 95% of acreage within the third-party's boundaries in time to calculate Total Nitrogen Removed values based on yield values reported in the INMP Summary Reports due 1 March 2021. By 1 March 2023, the third-party shall publish C_N coefficients for crops that cover 99% of acreage within the third-party's boundaries. For the crops that cover the remaining 1% of acreage within the third-party's boundaries, it is acceptable to use estimated C_N coefficients based on similar crop types. The methods used to establish C_N coefficients must be approved by the Executive Officer. Until C_N coefficients have been established for a particular crop, the member will only report the crop yield in the INMP. Nitrogen Removed includes nitrogen removal via harvest and nitrogen sequestered in permanent wood of perennial crops.

Nitrogen Applied/Nitrogen Removed Ratio (A/R Ratio)

The A/R ratio shall be reported as the ratio of total nitrogen applied to total nitrogen removed (calculated above).

Multi-Year Applied/Nitrogen Removed Ratio (A/R Ratio)

For each field for which three consecutive years of A/R ratio is available, the multi-year A/R ratio shall be reported as the ratio of total nitrogen applied to total nitrogen removed (calculated above) for the three prior to consecutive years.

Nitrogen Applied – Nitrogen Removed Difference (A-R Difference)

The A-R difference shall be reported as the numerical difference between total nitrogen applied and total nitrogen removed (calculated above).

The third-party shall review each Members' INMP Summary Reports and independently calculate and report both the A/R ratio and the A-R difference for the current reporting cycle (A/R_{1year} and $A\text{-}R_{1year}$). Beginning the third year of reporting, for those locations with data available for three years, the third-party shall calculate and report a three-year running total for both the A/R ratio and the A-R difference (A/R_{3year} and $A\text{-}R_{3\ year}$). The formulas for the A/R ratios and A-R differences are shown in the equation below.

$$A/R_{1\ year}\ \text{Ratio} = \frac{\text{Nitrogen Applied during current reporting cycle}}{\text{Nitrogen Removed during current reporting cycle}}$$

$$A/R_{3\ year}\ \text{Ratio} = \frac{\text{Sum of Nitrogen Applied during current and two previous reporting cycles}}{\text{Sum of Nitrogen Removed during current and two previous reporting cycles}} = \frac{\text{An+An}-1+\text{An}-2}{\text{Rn+Rn}-1+\text{Rn}-2}$$

A-R$_{1\ year}$ Difference $= \text{Nitrogen Applied (current reporting cycle)} - \text{Nitrogen Removed (current reporting cycle)}$

A-R$_{3\ year}$ Difference $= [\text{Sum of Nitrogen Applied (current and two previous reporting cycles)}] - [\text{Sum of Nitrogen Removed (current and two previous cycles)}]$

$= (\text{An} + \text{An} - 1 + \text{An} - 2) - (\text{Rn} + \text{Rn} - 1 + \text{Rn} - 2)$ where n=current reporting cycle

The following data shall be reported to the Central Valley Water Board in three tables:

Individual Field-Level AR Data by Anonymous Member ID Table: One entry is made for each field or management until reported.

1. Anonymous Member ID: Each Anonymous Member ID may be associated with more than one field
2. Crop: If the Member has more than one field of a given crop, these may be identified by crop plus a number (e.g. tomato$_1$, tomato$_2$).[15]
3. Nitrogen applied via fertilizers (lbs/acre)
4. Nitrogen applied via organics and compost (lbs/acre)
5. Nitrogen applied via irrigation water (lbs/acre)
6. Total Nitrogen applied (lbs/acre) [sum of nitrogen from fertilizer (3), organics/compost (4), and irrigation water (5)]
7. Nitrogen removed per acre (lbs/acre)
8. A/R ratio
9. A-R difference (lbs/acre)
10. 3-year A/R ratio if available

Individual Field-Level AR Data by Anonymous APN ID Table: An entry for a field or management unit may be repeated if there is more than one anonymous APN ID associated with the field or management unit.

1. Anonymous APN ID: List on separate line each Anonymous APN ID assigned to parcels the field overlays completely or partially.
2. Associated groundwater basin or sub-basin
3. Crop: If there is more than one field of a given crop in the APN, these may be identified by crop plus a number (e.g. tomato$_1$, tomato$_2$)[16]
4. Nitrogen applied via fertilizers (lbs/acre)
5. Nitrogen applied via organics and compost (lbs/acre)
6. Nitrogen applied via irrigation water (lbs/acre)
7. Total Nitrogen applied (lbs/acre) [sum of nitrogen from fertilizer (3), organics/compost (4), and irrigation water (5)]
8. Nitrogen removed per acre (lbs/acre)
9. A/R ratio

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[15] We recognize that, if multiple crop types are grown in the same field over the course of a year or over several years, variations on field nomenclature and crop reporting will be necessary. For example, the field could be identified as the same field in an extra column and an extra row could be added for each crop. In addition, the three-year A/R target range would likely need to be expressed as a weighted average of the crops grown during the three years.

[16] We recognize that, if multiple crop types are grown in the same field over the course of a year or over several years, variations on field nomenclature and crop reporting will be necessary. For example, the field could be identified as the same field in an extra column and an extra row could be added for each crop. In addition, the three year A/R target range would likely need to be expressed as a weighted average of the crops grown during the three years.

10. A-R difference (lbs/acre)
11. 3-year A/R ratio if available

Township-Level Aggregated AR Data Table:

1. Township and range
2. Crop
3. Total acreage: sum for all the acreage for each unique crop within the township (acres)
4. Total nitrogen applied via fertilizer: sum for all acreage for each unique crop (total lbs)
5. Total nitrogen applied via organics and compost: sum for compost for each unique crop (total lbs)
6. Total nitrogen applied via irrigation water: sum for all acreage for each unique crop (total lbs)
7. Total nitrogen applied for each unique crop (total lbs) [sum of nitrogen from fertilizer (3), organics/compost (4), and irrigation water (5)]
8. Total nitrogen removed for each unique crop (total lbs)
9. A/R ratio for each unique crop
10. A-R difference for each unique crop (total lbs)

E. Annual Monitoring Report

The Annual Monitoring Report (AMR) shall be submitted by 1 May every year, with the first report due 1 May 2015, except for report components 19, 20, and 21 which will be due 30 November of each year. The report shall cover the monitoring periods from the previous hydrologic water year. A hydrologic water year is defined as 1 October through 30 September. The report shall include the following components:

1. Signed Transmittal Letter;
2. Title page;
3. Table of contents;
4. Executive Summary;
5. Description of the third-party geographical area;
6. Monitoring objectives and design;
7. Sampling site/monitoring well descriptions and rainfall records for the time period covered under the AMR;
8. Location map(s) of sampling sites/monitoring wells, crops and land uses;
9. Tabulated results of all analyses arranged in tabular form so that the required information is readily discernible;
10. Discussion of data relative to water quality objectives/Trigger Limits, and water quality management plan milestones/Basin Plan Amendment Workplan (BPAW) updates, if applicable;
11. Electronic data submittal.
12. Sampling and analytical methods used;
13. Associated laboratory and field quality control samples results;
14. Summary of Quality Assurance Evaluation results (as identified in the most recent version

of the third-party's approved QAPP for Precision, Accuracy and Completeness);

15. Specification of the method(s) used to obtain estimated flow at each surface water monitoring site during each monitoring event;
16. Summary of exceedances of water quality objectives/Trigger Limits occurring during the reporting period and surface water related pesticide use information;
17. Actions taken to address water quality exceedances that have occurred, including but not limited to, revised or additional management practices implemented;
18. Evaluation of monitoring data to identify temporal and spatial trends and patterns;
19. INMP Summary Report Evaluations;
20. Summary of Management Practice information collected as part of Farm Evaluations
21. Summary of comparison of township Groundwater Protection Targets and actual value achieved for each township;
22. Summary of Mitigation Monitoring;
23. Summary of education and outreach activities;
24. Reduced Monitoring/Management Plan Verification Option Reports
25. Conclusions and recommendations.

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

Report Component No. 1—Signed Transmittal Letter

A transmittal letter shall accompany each report. The transmittal letter shall be submitted and signed in accordance with the requirements of section IX of the Order, Reporting Provisions.

Report Component No. 8—Location Maps

Location map(s) showing the sampling sites/monitoring wells, crops, and land uses within the third-party's geographic area must be updated (based on available sources of information) and included in the Monitoring Report. An accompanying GIS shapefile or geodatabase of monitoring site and monitoring well information must include the CEDEN comparable site code and name (surface water only) and Global Positioning System (GPS) coordinates (surface water sites and wells used for monitoring). 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 (at a minimum of five decimal places). The datum must be either WGS 1984 or NAD83, and clearly identified on the map(s) or in an associated key or table included in the report. The source and date of all data layers must be identified on the map(s) or in an associated key or table included in the report. All data layers/shapefiles/geodatabases included in the map shall be submitted with the Monitoring Report. If changes occur to any submitted data, the updated portion shall be submitted in the subsequent AMR.

Report Component No. 9 – Tabulated Results

In reporting monitoring data, the third-party shall arrange the data 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 data collection requirements of the MRP.

Report Component No. 10—Data Discussion to Illustrate Compliance

The report shall include a discussion of the third-party's compliance with the data collection

requirements of the MRP. If a required component was not met, an explanation for the missing data must be included. Results must also be compared to water quality objectives and trigger limits. If a Basin Plan Amendment Workplan (BPAW) has been approved by the Executive Officer, updates on progress made toward BPAW goals and milestones, including any adjustments to the time schedule, must be included.

Report Component No. 11 – Electronic Data Submittal

The annual electronic data submittal will include all of the elements listed in section V.A with information from the relevant reporting year.

Report Component No. 14 — Quality Assurance Evaluation (Precision, Accuracy and Completeness)

A summary of precision and accuracy results (both laboratory and field) is required in the report. The required data quality objectives are identified in the most recent version of the third-party's approved QAPP; acceptance criteria for all measurements of precision and accuracy must be identified. The third-party 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. Additionally, the report must include a discussion of how the failed QA/QC results affect the validity of the reported data. The corrective actions to be implemented are described in the QAPP Guidelines.

In addition to precision and accuracy, the third-party must also calculate and report completeness. Completeness includes the percentage of all quality control results that meet acceptance criteria, as well as a determination of project completeness. For further explanation of this requirement, refer to the most recent version of the QAPP Guidelines. The third-party may ask the laboratory to provide assistance with evaluation of their QA/QC data, provided that the third-party prepares the summary table or narrative description of the results for the Monitoring Report.

Report Component No. 16 — Summary of Exceedances

A summary of the exceedances of water quality objectives or trigger limits that have occurred during the monitoring period is required in the Monitoring Report. For exceedances of pesticide trigger limits, the data must be summarized in tables showing number of samples taken, number of detections, number of exceedances, and range of detection values. These data should be segregated by pesticide and monitoring site. In the event of exceedances for pesticides or toxicity in surface water, pesticide use data must be included in the Monitoring Report. Pesticide use information may be acquired from the agricultural commissioner. This requirement is described further in the following section on Exceedance Reports.

Report Component No. 18 — Evaluation of Monitoring Data

The third-party must evaluate its monitoring data in the Monitoring Report in order to identify potential trends[17] and patterns in surface and groundwater quality that may be associated with waste discharge from irrigated lands. As part of this evaluation, the third-party must analyze all readily available monitoring data that meet program quality assurance requirements to determine deficiencies in monitoring for discharges from irrigated agricultural lands and whether additional sampling locations or sampling events are needed or if additional constituents should be monitored. If deficiencies are identified, the third-party must propose a schedule for additional

[17] All results (regardless of whether exceedances are observed) must be included to determine whether there are trends in degradation that may threaten applicable beneficial uses.

monitoring or source studies. Upon notification from the Executive Officer, the third-party must monitor any parameter in an area that lacks sufficient monitoring data (i.e., a data gap should be filled to assess irrigated agriculture's effects on water quality).

The third-party should incorporate pesticide use information, as needed, to assist in its data evaluation. Wherever possible, the third-party should utilize tables or graphs that illustrate and summarize the data evaluation.

Report Component No. 19 – INMP Summary Report Evaluation

In addition to submitting the INMP Summary Reports Data, as described in Section V.D above, the third-party shall submit an evaluation comparing individual field data collected from the Members' INMP Summary Reports. These comparisons shall include the ratio of Nitrogen Applied to Nitrogen Removed[18] and the difference between Nitrogen Applied and Nitrogen Removed for crops in the Sacramento River Watershed. Nitrogen Applied includes nitrogen from any sources, including, but not limited to, organic amendments, synthetic fertilizers, and irrigation water.

The third-party's evaluation of both the $A/R_{1\ year}$ and $A/R_{3\ year}$ ratios must include, at a minimum, a comparison of A/R ratios by crop type. As directed by the Executive Officer, initial further evaluations within each crop type comparing the irrigation method, the soil conditions, and the farming operation size shall be developed. The third-party shall evaluate the corresponding $A\text{-}R_{1\ year}$ and $A\text{-}R_{3\ year}$ differences by crop type. The third-party shall also evaluate any other A/R ratio or A-R difference comparisons as directed by the Executive Officer. For each comparison, the third-party must identify the mean and the standard deviation as well as develop a histogram plot of the data. A box and whisker plot comparing the A/R ratio and A-R difference for each comparison, or equivalent tabular or graphical presentation of the data approved by the Executive Officer, may also be used. The summary of nitrogen management data must include a quality assessment of the collected information (e.g. missing data, potentially incorrect/inaccurate reporting), and a description of corrective actions to be taken regarding any deficiencies in the quality of data submitted, if such deficiencies were identified. Spreadsheets showing the calculations used for data evaluation must also be submitted to the Executive Officer. The third-party may include any recommendations regarding future A/R ratio target values.

Report Component No. 20 – Summary of Management Practice Information

The third-party shall aggregate and summarize information collected from Farm Evaluations.[19] 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, regarding any deficiencies in the quality of data submitted, if such deficiencies were identified.

Report Component (21) – GWP Target Summary Comparison

For each township, the third-party shall compare the GWP Target for the township and the actual value achieved in the township based on the A and R reported in the INMP Summary Reports.

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[18] For some crops the information needed to determine nitrogen removed may not be readily available. This will be determined through N removed research and crop yield will serve as a placeholder until nitrogen removed data is made available.

[19] Note that the evaluation of the reported management practices information is discussed in Appendix MRP-1 and will be part of the annual Management Plan Progress Report.

The third-party shall also provide comparisons of the current year's results to those of the previous years to establish the cumulative trend for each township.

Report Component No. 21 – Mitigation Monitoring

As part of the Monitoring Report, the third-party shall report on the CEQA mitigation measures reported by Members to meet the provisions of the Order and any mitigation measures the third-party has implemented on behalf of Members. The third-party is not responsible for submitting information that Members do not send them directly by the 1 March deadline (see section VII.F of the Order for individual Discharger 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.

F. Surface Water Exceedance Reports

The third-party 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 third-party 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 third-party 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 third-party shall send the Exceedance Report by email to the third-party'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 third-party may take to address the exceedance. Upon request, the third-party 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 location's watershed area. The investigation of toxicity exceedances must include all 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 Members within the same drainage area. Results of the pesticide use investigation must be summarized and discussed in the Monitoring Report.

G. Basin Plan Amendment Workplan

Should the third-party choose to pursue a Basin Plan Amendment as described in Section VIII.N. of the Order, the third-party must prepare a Basin Plan Amendment Workplan (BPAW) that includes the following elements:

1. A technical justification for initiating the basin plan amendment process including maps of the areas proposed for basin plan amendment. The justification must include an assessment of naturally occurring (background) concentrations of the constituent(s), evaluate the potential for irrigated agriculture to further degrade groundwater quality beyond background

in the identified areas, and include a preliminary evaluation as to whether controllable water quality factors (as defined in the Basin Plan) are reasonably likely to result in attainment of the applicable use(s);

2. A use attainability study plan to determine whether the beneficial use(s) proposed for de-designation may be attained through the application of current or anticipated technologies, whether groundwater within the proposed basin plan amendment area is currently being used for the beneficial use proposed for de-designation, and whether the groundwater proposed for de-designation meets any of the criteria set forth in the Basin Plan that the board considers in making exceptions to beneficial use designations;
3. A description of how the third-party will coordinate the basin plan amendment process through CV-SALTS, if the amendment is based on elevated salt and/or nitrate concentrations;
4. A proposal for reduced reporting requirements for Members in the areas proposed for basin plan amendment. The third-party may propose that trend monitoring be reduced in those areas. The third-party may also propose that the requirement that the Management Practice Evaluation Program evaluate those areas be suspended. The reduced monitoring and reporting requirements shall be no less stringent than the requirements for low vulnerability areas;
5. A description of the monitoring and reporting required to complete the BPAW must be identified; and
6. A time schedule including workplan goals and milestones for completing BPAW items.

To the extent applicable, the above BPAW workplan elements may be met by existing efforts. However, the third-party must provide the information associated with the applicable element demonstrating that element's requirements are met.

The Executive Officer may approve the BPAW workplan if the Executive Officer determines that the BPAW workplan includes all of the required elements. To approve the workplan, the Executive Officer must conclude that the technical justification provides sufficient evidence indicating that waters within the identified high vulnerability areas would likely qualify for de-designation of a beneficial use or uses under the Basin Plan. Should the Executive Officer approve the BPAW workplan, the Executive Officer will also provide the applicable approved modifications to the monitoring and reporting program.

Annual updates on progress made toward BPAW goals and milestones, including any proposed adjustments to the time schedule, must be included in the 15 June Semi-Annual Monitoring Report.

The Executive Officer may reinstate high vulnerability monitoring and reporting requirements if any of the following occur: 1) information gathered during implementation of the BPAW indicates a basin plan amendment is unlikely to be adopted, 2) the basin plan amendment is not likely to be brought before the board within five years of the original proposal date due to insufficient progress in meeting workplan goals and milestones, or 3) the basin plan amendment is not approved by the regional board or state water board.

VI. Sediment Discharge and Erosion Assessment Report

The third-party shall prepare a Sediment Discharge and Erosion Assessment Report. The report shall be submitted to the Executive Officer for review. The goal of the report is to determine which irrigated agricultural areas within the Sacramento River Watershed are subject to erosion and may discharge sediment that may degrade surface waters. The objective of the report is to

determine which Member operations are within such areas, and need to develop a Sediment and Erosion Control Plan. The report must be developed to achieve the above goal and objective and must at a minimum, provide a description of the sediment and erosion areas as a series of ArcGIS shapefiles with a discussion of the methodologies utilized to develop the report.

VII. Watershed/Subwatershed Based Sediment and Erosion Control Plans

Per section VII.C.2. of Order R5-2014-0030-06, the third-party may assist Members to fulfill sediment and erosion control requirements through a Watershed/Subwatershed based Sediment and Erosion Control Plan that includes collective management practices. Any watershed/ subwatershed based (or collective) Sediment and Erosion Control Plan shall include, at a minimum, the following: 1) a time schedule for implementation and/or installation of collective management practices to ensure compliance with water quality objectives[20]; 2) a description of the funding mechanism for implementation and/or installation of collective management practices; 3) identification of the individuals or parties (e.g., Flood Control District) that will be primarily responsible for implementation and/or installation of collective management practices; 4) a description of the water quality benefits that will occur due to or from implementation of collective management practices; 5) a reporting schedule for submittal of progress reports to the Central Valley Water Board; and, 6) a description of individual sediment and erosion control practices that will also be implemented, or a technical justification as to why individual sediment and erosion control practices would not be applicable to the watershed/subwatershed (or collective) plan.

VIII. Water Quality Triggers for Development of Management Plans

This Order requires that Members 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 5 of this MRP lists Basin Plan numeric water quality objectives and NTR/CTR criteria for constituents of concern that may be discharged by Members. [21]

Table 5 does not include water quality criteria that may be used to interpret narrative water quality objectives, which shall be considered Trigger Limits. Trigger limits 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. All Trigger Limits must be consistent with applicable Basin Plan policies governing the interpretation of narrative water quality objectives.

IX. Quality Assurance Project Plan (QAPP)

The third-party must develop and/or maintain a QAPP that includes watershed and site-specific

[20] The time schedule for compliance shall be consistent with Provision XII of Order R5-2014-0030-06 for surface water.

[21] Future actions 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 5.

information, project organization and responsibilities, and the quality assurance components in the QAPP Guidelines (see section IX of this MRP). Chemical, bacteriological, and bioassay analyses shall be conducted at a 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 Sacramento Valley Water Quality Coalition's existing QAPP was approved by the Executive Officer in 2010. The existing QAPP is acceptable for use by the third-party. Any necessary modifications to the QAPP for groundwater monitoring shall be submitted with the MPEP and groundwater trend monitoring workplans (section IV, MRP). Any proposed modifications to the approved QAPP must receive Executive Officer approval prior to implementation.

The Central Valley Water Board may conduct an audit of the third-party's contracted laboratories at any time in order to evaluate compliance with the most current version of the QAPP guidelines. Quality control requirements are applicable to all the constituents listed in the 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 12 March 2014 and remains in effect as revised on 5 June 2015, 5 May 2017, and 7 February 2019, unless rescinded or revised by the Central Valley Water Board or the Executive Officer.

I, PATRICK PULUPA, 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 12 March 2014 and revised on 5 June 2015, 5 May 2017, and 7 February 2019.

Original signed by

_____

PATRICK PULUPA, Executive Officer

Table 5 Numeric water quality objectives from the Basin Plan, California Maximum Contaminant Levels (MCL) and the California Toxics Rule.

Constituent / Parameter Chemical Abstracts Service (CAS) Registry Number (Synonym, if any)	Basin Plan Water Quality Objective	Numeric Water Quality Objectives			G = Groundwater IS = Inland Surface Water	Numeric Threshold Protects Designated Beneficial Use(s) in the Water Body						
						Groundwater			Inland Surface Waters			
		Source of Numeric Threshold *(footnotes in parentheses are at bottom of table)*	Numeric Threshold (a)	Units		MUN- MCL	MUN-Toxicity	AGR	MUN-MCL	MUN-Toxicity	Aquatic Life & Consumption	AGR
Arsenic 7440-38-2	Chemical Constituents	Basin Plan. Sacramento River from Keswick Dam to the I Street Bridge at City of Sacramento; American River from Folsom Dam to the Sacramento River; Folsom Lake; and the Sacramento-San Joaquin Delta.	10	ug/L	IS							
Chlorpyrifos 2921-88-2	Pesticides	Basin Plan. 1-hour average	0.025	µg/L	IS						X	
		Basin Plan. 4-day average	0.015	µg/L	IS						X	
Coliform, fecal	Bacteria	Basin Plan (d) (e)	200/100	MPN/mL	IS				X			
		Basin Plan (d) (f)	400/100	MPN/mL	IS				X			
Coliform, total	Bacteria	Basin Plan	2.2/100	MPN/mL	G	X						
Conductivity (at 25° C)	Salinity	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	150	µS/cm	IS							
		Basin Plan. Sacramento River	230 (50 percentile),	µS/cm								
(Electrical conductivity)		California Secondary MCL	900-1600	µS/cm	G & IS	X	X		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), (g) (dissolved copper)	variable	µg/L	IS						X	
Diazinon	Pesticides	Basin Plan. Delta Waterways, Sacramento River from Shasta Dam to Colusa Basin Drain, Sacramento River from the Colusa Basin Drain to I Street Bridge. Feather River from Fish Barrier Dam to Sacramento River; 1-hour average	0.16	µg/L	IS						X	
50-29-3		Basin Plan. As above; 4-day average	0.10	µg/L	IS						X	

Constituent / Parameter Chemical Abstracts Service (CAS) Registry Number (Synonym, if any)	Basin Plan Water Quality Objective	Numeric Water Quality Objectives			G = Groundwater IS = Inland Surface Water	Numeric Threshold Protects Designated Beneficial Use(s) in the Water Body						
						Groundwater			Inland Surface Waters			
		Source of Numeric Threshold *(footnotes in parentheses are at bottom of table)*	Numeric Threshold (a)	Units		MUN- MCL	MUN-Toxicity	AGR	MUN-MCL	MUN-Toxicity	Aquatic Life & Consumption	AGR
Dissolved Oxygen, minimum 7782-44-7	Dissolved Oxygen	Basin Plan. Sacramento River from Keswick Dam to Hamilton City, 1 June – 31 August	9.0	mg/L	IS						X	
		Basin Plan. Feather River from Fish Barrier Dam at Oroville to Honcut Creek	8.0	mg/L	IS						X	
		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	
Lead 7439-92-1	Chemical Constituents	California Primary MCL (total lead)	15	µg/L	G & IS	X			X			
	Toxicity	California Toxics Rule (USEPA) (g) (dissolved lead)	variable	µg/L	IS						X	
Nitrate (as nitrogen) 14797-55-8	Chemical Constituents	California Primary MCL	10	mg/L	G & IS	X	X		X	X		
Nitrite (as nitrogen) 14797-65-0	Chemical Constituents	California Primary MCL	1	mg/L	G & IS	X	X		X	X		
Nitrate+Nitrite (as nitrogen)	Chemical Constituents	California Primary MCL	10	mg/L	G & IS	X	X		X	X		
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		
Selenium, total 7782-49-2	Chemical Constituents	California Primary MCL	50	µg/L	G & IS				X			
	Toxicity	National Toxics Rule (USEPA), 4-day mean	5	µg/L	IS	X					X	
Simazine 122-34-9	Chemical Constituents	California Primary MCL	4	µg/L	G & IS	X	X		X	X		
Temperature	Temperature	Basin Plan (h)	variable		IS							
Total Dissolved Solids (TDS)	Chemical Constituents	California Secondary MCL, recommended level	500 – 1,000	mg/L	G & IS	X	X		X	X		

Constituent / Parameter Chemical Abstracts Service (CAS) Registry Number (Synonym, if any)	Basin Plan Water Quality Objective	Numeric Water Quality Objectives			G = Groundwater IS = Inland Surface Water	Numeric Threshold Protects Designated Beneficial Use(s) in the Water Body						
						Groundwater			Inland Surface Waters			
		Source of Numeric Threshold *(footnotes in parentheses are at bottom of table)*	Numeric Threshold (a)	Units		MUN- MCL	MUN-Toxicity	AGR	MUN-MCL	MUN-Toxicity	Aquatic Life & Consumption	AGR
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							
Zinc	Chemical Constituents	California Secondary MCL (total zinc)	5,000	µg/L	G & IS	X			X			
7440-66-6	Toxicity	California Toxics Rule (USEPA) (g) (dissolved zinc)	variable	µg/L	IS						X	

Footnotes to Table 8:

a	Numeric thresholds are maximum levels unless noted otherwise.
b	Monthly mean.
c	See Basin Plan for definition of Critical Year.
d	Applies in waters designated for contact recreation (REC-1).
e	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.
f	No more than ten percent of the total number of samples taken during any 30-day period shall exceed this number.
g	The numeric thresholds for dissolved metals are hardness dependent. As hardness increases, water quality objectives generally increase.
h	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 Fahrenheit (or 2.78°C) above natural receiving water temperature.
i	See Delta Waterways listed in Appendix 42 of the Basin Plan

Beneficial Uses:

AGR – Agricultural water uses, including irrigation supply and stock watering

Aquatic Life & Consumption – Aquatic life and consumption of aquatic resources

MUN-MCL – Municipal or domestic supply (MUN) with default selection of drinking water maximum contaminant limit (MCL) when available

MUN-Toxicity – Municipal or domestic supply (MUN) with consideration of human toxicity thresholds that are more stringent than drinking water maximum contaminant limits (MCLs)

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
CENTRAL VALLEY REGION

ORDER R5-2014-0030-06
MONITORING AND REPORTING PROGRAM
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 Growers within the Sacramento River Watershed that are Members of the Third-Party Group, Order R5-2014-0030-06 (hereafter "Order"). When a management plan has been triggered, the third-party shall ascertain whether or not irrigated agriculture is 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 unknown, the third-party may propose studies to be conducted to determine the cause, or to eliminate irrigated agriculture as a potential source (see Source Identification Study Requirements in section I.G. 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. The third-party 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 third-party would maintain the overarching plan as new information is collected, potentially triggering additional management plans and completion of other management plans.

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 third-party 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 third-party may continue to utilize the surface water quality prioritization process described in the Sacramento Valley Water Quality Coalition's Management Plan[1] as approved by the Executive Officer. The Executive Officer may approve or require changes be made to the SQMP/GQMP priority list. The third-party shall implement the prioritization schedule approved by the Executive Officer.

A. Introduction and Background Section

The introduction portion of the management plan shall include a discussion of the 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 (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.

[1] The Sacramento Valley Water Quality Coalition Management Plan was approved by the Executive Officer on 2 February 2009.

B. Physical Setting and General 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. For groundwater, these maps may already be presented in the Groundwater Quality Assessment Report (GAR) and may be referenced and/or updated as appropriate. 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 irrigated lands as a potential source. Requirements for source identification studies are given in section I.G below. In the alternative, instead of conducting a source identification study, the third-party 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 third-party'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 by the appropriate Natural Resources Conservation Service (NRCS) soil survey or other applicable studies. The soil unit descriptions and a map of their areal extent within the study area must be included. The GAR developed for the third-party's geographic area, and the soils mapping contained in that document, may satisfy this requirement.

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 known from existing publications, including the GAR (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 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 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. Actions to meet the following goals and objectives:

   a. Compliance with the Order's receiving water limitations (section III of the Order).

   b. Educate Members 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. A description of 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); ineffective practices should also be discussed. 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 third-party 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. The performance goals shall include any developed GWP Targets.

D. 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 third-party determines that field studies are appropriate or the Executive Officer requires a technical report under CWC 13267 for a field study, the third-party 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 third-party's Management Practice Evaluation Program 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). This may include commodity-based representative monitoring that is conducted to determine the effectiveness of management practices implemented under the GQMP. Refer to section IV of the MRP for groundwater monitoring requirements.

E. 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 present data and 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, $A/R_{3\ year}$ ratio results, and GWP Targets where appropriate. The approach for determining the effectiveness of the management practices implemented must be described and when appropriate related to changes in $A/R_{3\ year}$ results. 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 and $A/R_{3\ year}$ ratio results must also be described. The process must include a description of how the information from the Farm Evaluation, Management Practice Implementation Report (MPIR), and INMP Summary Report is collected from growers, how the information will be verified, and how the information will be reported.

F. Records and Reporting

With each annual monitoring report, the third-party must prepare a Management Plan Status Report that summarizes the status in implementing management plans. The Management Plan Status Report must summarize the progress for the reporting period. The Management Plan Status 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 including a list of management practices recommended
(9) A summary of management plan grower outreach conducted
(10) A summary of the degree of implementation of management practices by growers within the management plan area

(11) Results from evaluation of management practice effectiveness, including the $A/R_{3\ year}$ ratio when evaluating a GQMP
(12) An evaluation of progress in meeting performance goals and schedules
(13) Any recommendations for changes to the management plan

Pursuant to Section VII.G of the Order, the third-party must additionally require submission of a Management Practice Implementation Report (MPIR) by members according to a schedule to be specified by the third-party for each SQMP or GQMP and approved by the Executive Officer.

G. Source Identification Study Requirements

Should the third-party conduct a Source Identification Study to comply with this Order, the third-party must first receive approval from the Executive Officer. Once approved, the third-party may proceed with its study.

The minimum components for a source identification study are:

(1) An evaluation of the types of practices, commodities, and locations that may be a source.
(2) Continued monitoring at the management plan site/area and increased monitoring if appropriate.
(3) An assessment of the potential pathways through which waste discharges can occur.
(4) A schedule for conducting the study.

Commodity specific and/or management practice specific field studies (including edge-of field studies) may be required to approximate the contribution of irrigated agriculture. At a minimum, the third-party must evaluate the feasibility of field studies as part of its source identification study proposal. Where field studies are deemed appropriate, the third-party should identify a reasonable number and variety of field study sites that are representative of the particular commodity or management practice being evaluated. If field studies are not proposed, the third-party must demonstrate how the alternative source identification method will produce data or information that will enable the determination of contributions from irrigated agricultural operations to the water quality problem.

If an approved study shows that irrigated lands are not a cause or a contributing source, then the third-party can request the Executive Officer to approve completion of the associated management plan. Where irrigated lands are identified as a source, a full SQMP/GQMP shall be prepared and implemented.

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 third-party 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 third-party 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 irrigated agriculture waste discharges are 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 third-party may be required to develop and implement a field monitoring study plan to characterize the commodity-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 third-party 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 irrigated agriculture is not a source, then the third-party 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 occurred[2]) or demonstrated compliance with the Order's surface and groundwater receiving water limitations.
b) Documentation of third-party education and outreach to applicable Members in the watershed where water quality impairment occurred.
c) Documentation of Member implementation of management practices that address the water quality exceedances.
d) Demonstration that the management practices implemented by Members 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 third-party 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 third-party shall not discontinue any of the associated management plan requirements prior to Executive Officer approval of its completion request.

[2] The demonstration must include consideration of peak use periods (for pesticides) and/or periods when a parameter is likely to be present.

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
CENTRAL VALLEY REGION

ORDER R5-2014-0030-06
MONITORING AND REPORTING PROGRAM
APPENDIX 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) R5-2014-0030-06.

Implementation of the MPEP requires that the third-party 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 third-party 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 (MWISP)

Prior to installation of groundwater monitoring wells, a Monitoring Well Installation and Sampling Plan (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 third-party 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, the third-party 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 third-party in writing that the MWISP is acceptable. The MWISP or an MWISP for the initial phase if the third-party 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 R5-2014-0030-06, "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 third-party 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 third-party 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 third-party 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 third-party'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, tile-drainage systems including discharge points, chemigation and/or fertigation tanks, flood control features, 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 R5-2014-0030-06 and QAPP guidelines.

III. Monitoring Well Installation Completion Report (MWICR)

Within 60 days after completion of any monitoring well network, the third-party 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, tile-drainage systems including discharge points, chemigation and/or fertigation holding tanks, flood control features, 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

ORDER R5-2014-0030-06
MONITORING AND REPORTING PROGRAM
APPENDIX MRP-3
REPRESENTATIVE MONITORING SITES AND SUBWATERSHED DRAINAGES

This appendix is provided as part of Monitoring and Reporting Program Order R5-2014-0030-06 that includes requirements for a third-party representative entity assisting individual irrigated lands operators or owners that are members of the third-party. This appendix uses information from the Sacramento Valley Water Quality Coalition's (SVWQC) Monitoring and Reporting Program Order R5-2009-0875 (2009 MRP), Attachment C. Information for the Goose Lake subwatershed is from the Goose Lake Coalition June 2007, December 2007 Semi-Annual Monitoring Reports and the 2010 Annual Monitoring Report. The purpose of this appendix is to document the representative monitoring sites in each subwatershed for the third-party monitoring program and to provide background information that can be applied to selecting drainages that may qualify for the reduced monitoring/management practice verification option (see Attachment B, MRP Section III.C.1.a).

Under the 2009 MRP, monitoring sites were selected by the Sacramento Valley Water Quality Coalition in each subwatershed area of the Sacramento River Watershed. Under MRP Order R5-2014-0030-06, the monitoring sites are categorized as Representative, Integration and/or Special Project sites according to the approach described in the MRP section III.A. Representative sites are shown in the tables in this appendix with the drainages that they represent and all of the relevant drainages are shown in the subwatershed maps included here and provided by the SVWQC.

The Sacramento Valley Water Quality Coalition is organized into twelve (12) subwatershed areas (Figure 1). Each subwatershed area is organized and managed by a group of local representatives who are actively engaged in agriculture and/or resource management in their region.

Each of the SVWQC's Subwatershed Groups is listed below, along with the name of the managing entity(s) (in parentheses):

- Butte-Yuba-Sutter Subwatershed (Sutter County RCD and Farm Bureau)
- Colusa-Glenn Subwatershed (Colusa Glenn Subwatershed Program)
- El Dorado Subwatershed (El Dorado County Agricultural Water Quality Management Corporation)
- Lake Subwatershed (Lake County Agricultural Watershed Program)
- Napa Subwatershed (Napa County Putah Creek Watershed Group)
- Pit River Subwatershed (Northeastern California Water Association)
- Placer-Nevada-South Sutter-North Sacramento Subwatershed (PNSSNS Subwatershed Group)
- Sacramento-Amador Subwatershed (Sacramento Amador Water Quality Alliance)
- Shasta-Tehama Subwatershed (Shasta Tehama Water Education Coalition)
- Solano Subwatershed (Solano Resource Conservation District Water Quality Coalition)

- Yolo Subwatershed (Yolo County Farm Bureau Education Corporation)
- Upper Feather River Subwatershed (Upper Feather River Watershed Group)
- Goose Lake Subwatershed (Goose Lake Resource Conservation District)

Figure 1. Subwatershed areas in the Sacramento River Watershed

Butte-Yuba-Sutter Subwatershed

The Butte-Yuba-Sutter Subwatershed encompasses approximately 1,874,510 acres in the central portion of the Sacramento Valley, and includes all of Butte and Yuba Counties and roughly three-quarters of Sutter County. Approximately 251,000 acres are in the upper portions of the watershed and have no irrigated acreage. The subwatershed area is bounded on the east by the Sierra Nevada Range, on the west by the Sacramento River, on the north by the Tehama County line, and on the south by the Feather and Bear Rivers. Topography varies from a relatively flat valley floor, to rolling foothills and volcanic buttes, to steep forested mountains and deep river canyons. Elevation ranges from approximately 20 to 7,000 feet above sea level. Irrigated agriculture occurs in a large portion of the Butte-Yuba-Sutter Subwatershed, with approximately 570,000 acres currently being farmed, a significant portion (about 260,000 acres) of which is planted in rice. Some dryland grains are also grown, typically in rotation with other field crops. Other land use types include non-irrigated grazing rangeland, urban and rural residential development, and coniferous forests, oak woodlands, grasslands, and wetlands.

The Butte-Yuba-Sutter Subwatershed encompasses 32 different drainages where irrigated agriculture is present. Table 1 lists the drainages by name and the crops grown within each drainage area. Figure 2 shows the extent of the drainages.

Table 1. Butte-Yuba-Sutter Subwatershed Drainages and Crops

Type of Monitoring	Drainages	Crops
Monitoring site in Pine Creek	Pine Creek	Almonds, walnuts, prunes, pasture, grain, beans, safflower
Represented by Pine Creek monitoring site	Little Chico Creek	Almonds, rice, grain, wheat, corn, walnuts, prunes, beans
	Big Chico Creek	Almonds, walnuts, wheat, pasture, prunes, beans
	Dicus Slough	Walnuts, almonds, prunes, olives
Monitoring site in Lower Snake River	Lower Snake River	Rice, prunes, peaches, nursery, walnuts, pasture, almonds, nectarines
Represented by Lower Snake River monitoring site	Cherokee Canal	Rice, prunes, almonds, walnuts, peaches
	Butte Creek	Rice, almonds, walnuts, pecans, beans, sunflower, safflower
	Lower Oroville	Walnuts, prunes, rice, peaches,
	Gilsizer	Prunes, peaches, walnuts, rice, tomatoes, melons/squash, sunflower, safflower

Monitoring Site on Lower Honcut Creek	Lower Honcut Creek	Rice, walnuts, prunes, pasture, citrus, olives, grapes, pasture
Represented by Lower Honcut Creek monitoring site	Jack Slough	Rice, prunes, peaches, pasture
	Lower Yuba River	Peaches, walnuts, olives, prunes, pasture, cherries
	Feather River Direct – Sutter	Walnuts, prunes, peaches
	Feather River Direct – Yuba	Peaches, prunes, walnuts, cherries, pears
	South Honcut Creek	Pasture
	North Honcut Creek	Pasture
	Browns Valley	Pasture
	Dry Creek – Yuba	Pasture
	North Yuba River	Pasture
	Upper Jack Slough	Pasture, rice
	Oroville Dam	Pasture, grain
	Grasshopper Slough	Walnuts, rice, pasture, almonds, prunes, safflower, peaches, nectarines, melons and squash
	Ageden Slough	Rice, prunes, pasture, walnuts, peaches, alfalfa, sunflowers, safflower, apples
	Chandler	Rice, prunes, walnuts, peaches, alfalfa, wheat, melons
	RD 823	Rice, wheat, walnuts, alfalfa, prunes, safflower, peaches and nectarines
Monitoring Site on Wadsworth Canal	Lower Honcut Creek	Rice, walnuts, prunes, pasture, citrus, olives, grapes, pasture
Represented by Wadsworth Canal Monitoring Site	Wadsworth	Rice, prunes, peaches, walnuts, pasture, beans, melons
	RD 1500 (Robbins Basin)	Rice, beans, alfalfa, hay, corn, wheat, tomatoes, pumpkins, melons, onions, walnuts, milo, safflower, sunflower, sudan
	RD 70	Rice, safflower, walnuts, tomatoes, grain, beans, melons/squash, sunflowers, alfalfa
	RD 1660	Rice, safflower, tomatoes, grain, melons/squash, beans, walnuts, sunflowers
	Sutter	Grain, rice, almonds, safflower, walnuts, beans

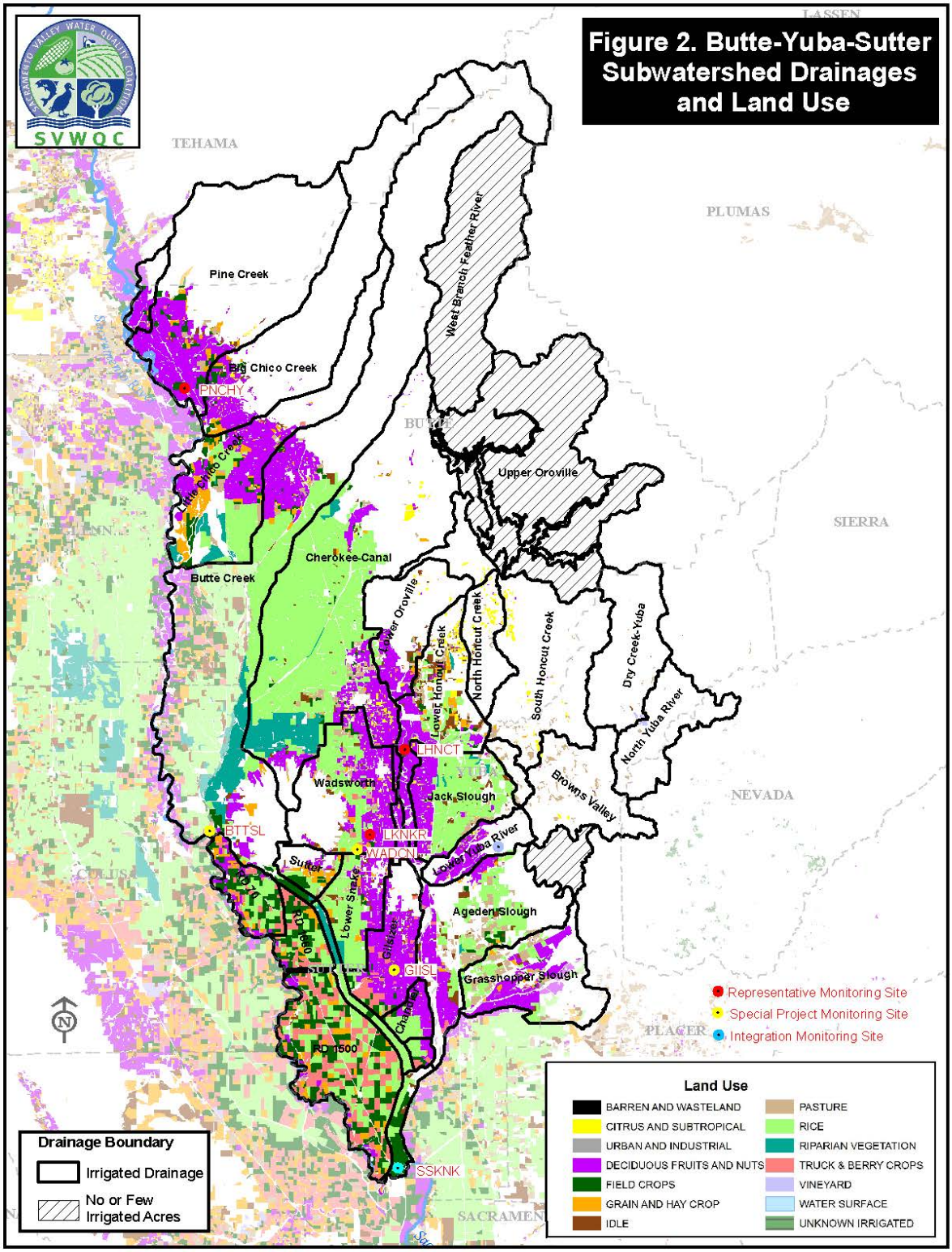


Figure 2. Butte-Yuba-Sutter Subwatershed Drainages and Land Use
SVWQC
TEHAMA
PLUMAS
SIERRA
NEVADA
PLACER
Pine Creek
Big Chico Creek
PNCHY
Butte Creek
Cherokee Canal
West Branch Feather River
Upper Oroville
Lower Oroville
Lower Honcut Creek
North Honcut Creek
South Honcut Creek
Dry Creek-Yuba
North Yuba River
Browns Valley
LHNCT
Wadsworth
Jack Slough
LKNKR
BTTSL
WADCNL
Lower Yuba River
Sutter
Ageden Slough
GIISL
Grasshopper Slough
Representative Monitoring Site
Special Project Monitoring Site
Integration Monitoring Site
Land Use
BARREN AND WASTELAND
CITRUS AND SUBTROPICAL
URBAN AND INDUSTRIAL
DECIDUOUS FRUITS AND NUTS
FIELD CROPS
GRAIN AND HAY CROP
IDLE
PASTURE
RICE
RIPARIAN VEGETATION
TRUCK & BERRY CROPS
VINEYARD
WATER SURFACE
UNKNOWN IRRIGATED
Drainage Boundary
Irrigated Drainage
No or Few Irrigated Acres
SSKNK

Colusa-Glenn Subwatershed

The Colusa-Glenn Subwatershed encompasses approximately 1.6 million acres in the west central portion of the Sacramento Valley, and includes all of Colusa and Glenn Counties and the northern portion of Yolo County. The subwatershed area is bounded on the east by the Sacramento River and Butte Creek, on the West by the Coast Ranges, on the north by the Tehama County line, and on the south by Cache Creek from the Dunnigan Hills, through the town of Yolo, to the Sacramento River at the Fremont Weir just south of Knight's Landing. Topography varies from a relatively flat or gently sloping valley floor, to rolling Coast Range foothills, to steep mountainous terrain. Elevation ranges from approximately 35 to 7,000 feet above sea level. Irrigated agriculture occurs in about 40% of the Colusa-Glenn Subwatershed, with approximately 600,000 acres currently being farmed, approximately 230,000 of which is rice. Over 520,000 acres in the subwatershed are in the Coast Range and have no significant irrigated acres. Some dryland grains are also grown, typically in rotation with other field crops. Other land use types include non-irrigated grazing rangeland, urban/rural residential development, and oak woodlands, grasslands, and wetlands.

The Colusa-Glenn Subwatershed encompasses 31 different drainages where irrigated agriculture is present. Table 3 lists the drainages by name and the crops grown within each drainage area. Figure 3 shows the extent of the drainages.

Table 3. Colusa-Glenn Subwatershed Drainages and Crops

Type of Monitoring	Drainages	Crops
Monitoring site in Walker Creek	Walker Creek	Rice, grain, pasture, corn, almonds, olives, range
Represented monitoring site in Walker Creek	Lower Stony Creek	Pasture, prunes, almonds, grain, walnuts
	Orland Area	Almonds, pasture, grain, walnuts, corn, prunes
	Upper Colusa Drain	Rice, grain, almonds, corn, pasture, walnuts
	Logan Creek	Rice, grain, corn, pasture, cotton, sunflower, walnuts
	Bounde Creek	Rice, walnuts, almonds
	Provident Drain	Rice, grain, pasture, corn
	Packer Road	Rice, tomatoes, wheat, prunes
	Upper Stony Gorge	Range, pasture
	Upper Stony Creek	Range, pasture
Monitoring site in Freshwater Creek	Freshwater Creek	Rice, tomatoes, squash, grain, pasture, safflower
Represented monitoring site Freshwater Creek	West Canal Landing	Rice, wheat, tomatoes, melons/squash, safflower
	College City Area	Almonds, tomatoes, wheat, pasture
	Sycamore area	Rice, tomatoes, wheat, safflower, melons/squash
	Lurline Creek	Rice, pasture, grain, melons/squash
	Maxwell NE Drain	Rice, safflower
	Sand Creek	Rice, tomatoes, almonds, squash/melons
	Petroleum Creek	Almonds, wheat, tomatoes, melons/squash, pasture
	Elk Creek	Almonds, wheat, pasture
	East Park Reservoir	Grain
	Upper East Park	Grain, walnuts
	Stone Corral Creek	Rice, wheat, safflower, pasture
	Bear Creek	Grain, pasture
	Hopkins Slough	Rice, wheat, prunes, safflower

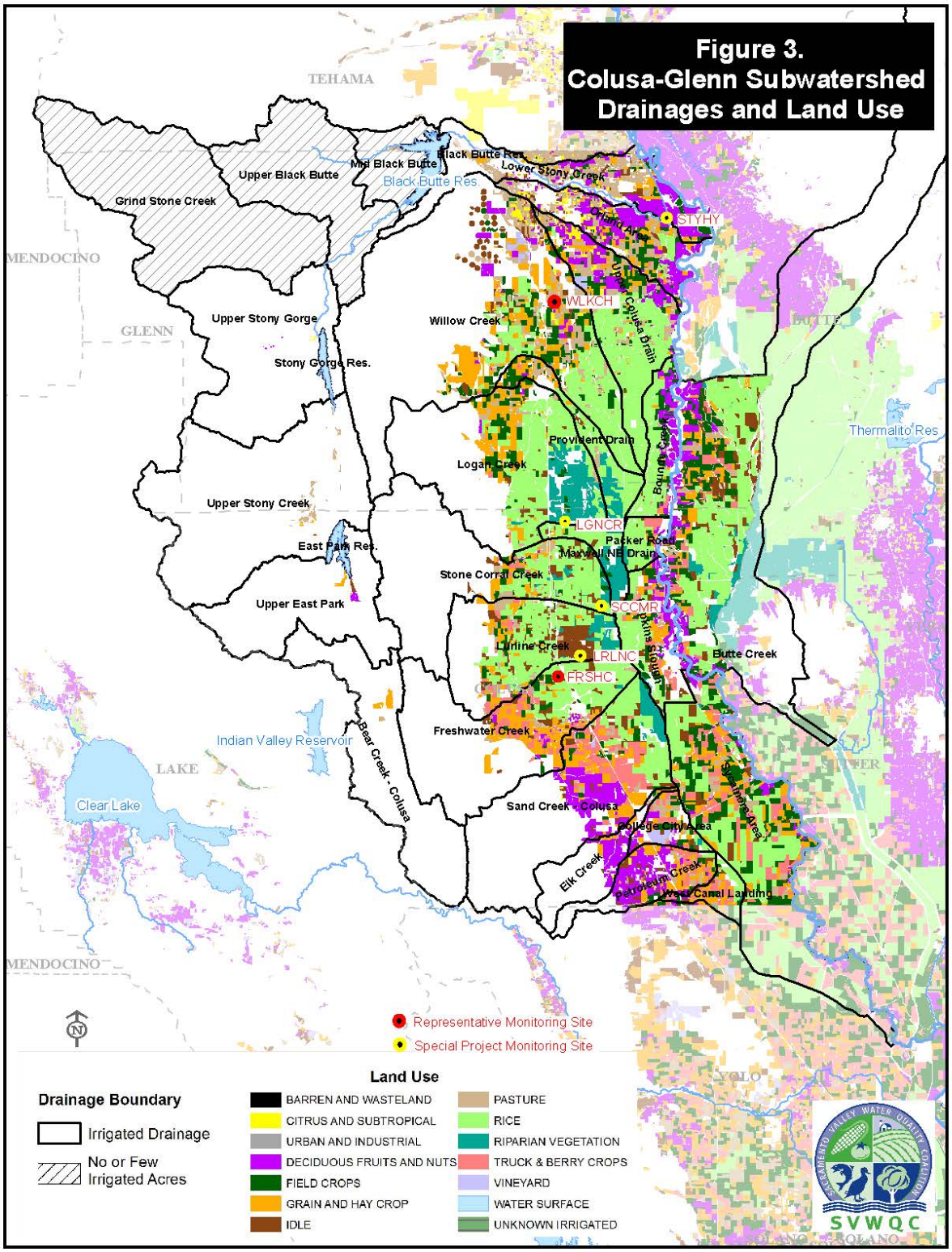


Figure 3.
Colusa-Glenn Subwatershed
Drainages and Land Use
TEHAMA
MENDOCINO
GLENN
BUTTE
LAKE
YOLO
SOLANO
Grind Stone Creek
Upper Black Butte
Mid Black Butte
Black Butte Res.
Black Butte Res.
Lower Stony Creek
Upper Stony Gorge
Stony Gorge Res.
Willow Creek
Upper Colusa Drain
Provident Drain
Logan Creek
Boundary Creek
Upper Stony Creek
East Park Res.
Upper East Park
Packer Road
Maxwell NE Drain
Stone Corral Creek
Hopkins Drain
Lurline Creek
Butte Creek
Freshwater Creek
Bear Creek - Colusa
Indian Valley Reservoir
Clear Lake
Sand Creek - Colusa
College City Area
Sycamore Area
Elk Creek
Petroleum Creek
West Canal Landing
Thermalito Res.
STYHY
WLKCH
LGNCR
SCCMR
LRLNC
FRSHC
Representative Monitoring Site
Special Project Monitoring Site
Land Use
Drainage Boundary
Irrigated Drainage
No or Few Irrigated Acres
BARREN AND WASTELAND
CITRUS AND SUBTROPICAL
URBAN AND INDUSTRIAL
DECIDUOUS FRUITS AND NUTS
FIELD CROPS
GRAIN AND HAY CROP
IDLE
PASTURE
RICE
RIPARIAN VEGETATION
TRUCK & BERRY CROPS
VINEYARD
WATER SURFACE
UNKNOWN IRRIGATED
SVWQC

El Dorado Subwatershed

The El Dorado Subwatershed encompasses approximately 1.1 million acres in the two primary river watersheds—South Fork American River and Cosumnes River—of El Dorado County, extending from the crest of the Sierra Nevada mountains west to Folsom Lake and from the Cosumnes River north to the Rubicon River. The topography is characterized by mountainous terrain with elevations ranging from approximately 400 to 10,000 feet above sea level. More than 55% (636,000 acres, *El Dorado County DRAFT General Plan EIR, Section 5.12 Biological Resources, EDAW, May 2003)* of the subwatershed consists of native vegetation dominated by conifer forest and oak/grass woodlands. Agricultural use occurs on about 5,000 acres, or 0.5% of the watershed area, and is typically situated at elevations ranging from 1,200 to 3,000 feet above sea level.

El Dorado Subwatershed encompasses nine main drainages where irrigated agriculture is present. Table 4 lists the drainages by name and the crops grown within each drainage area. Figure 4 shows the area of the nine drainages.

Table 4. El Dorado Subwatershed Drainages and Crops

Type of Monitoring	Drainages	Crops
Monitoring site in North Canyon Creek	Coloma	Winegrapes, apples, pears, peaches, plums, berries, olives, irrigated pasture, Christmas trees
Represented by North Canyon Creek monitoring site	Clear & Camp Creeks	Winegrapes
	Green Valley	Winegrapes, irrigated pasture
	Lower North Fork Cosumnes River	Winegrapes, walnuts, Christmas trees
	Middle Cosumnes River	Winegrapes, walnuts, Christmas trees
	Middle Fork Cosumnes River	Winegrapes, walnuts, Christmas trees
	South Fork Cosumnes River	Winegrapes, walnuts
	Upper North Fork Cosumnes River	Winegrapes
	Weber Creek	Winegrapes, olives, irrigated pasture, Christmas trees

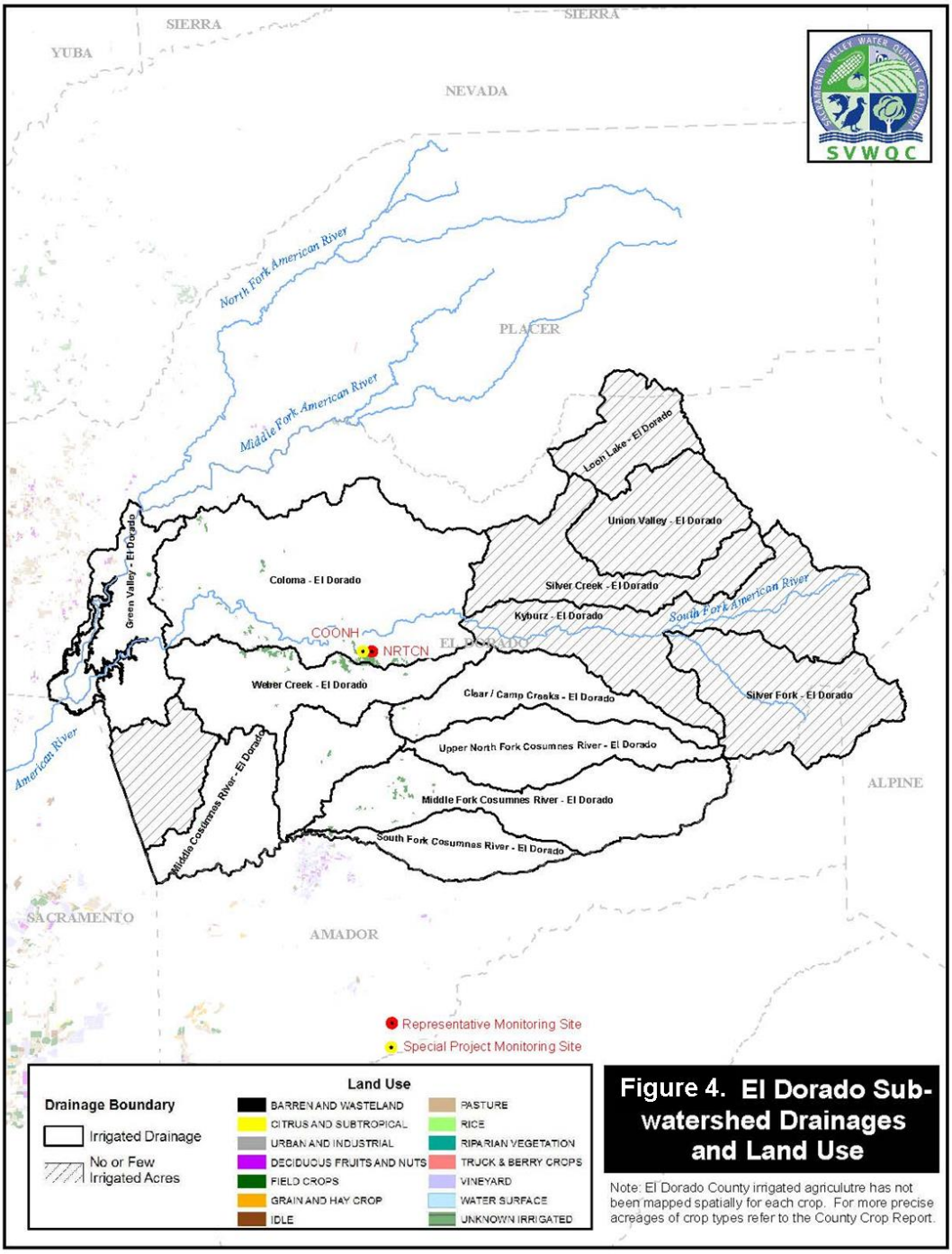


Figure 4. El Dorado Sub-watershed Drainages and Land Use

Note: El Dorado County irrigated agriculutre has not been mapped spatially for each crop. For more precise acreages of crop types refer to the County Crop Report.

Lake and Napa Subwatersheds

The Lake and Napa Subwatersheds encompass approximately 850,000 acres on the southwest side of the Sacramento Valley, and include roughly two-thirds of Lake County and one-third of Napa County (Figure 6). These subwatershed areas are located in the central Coast Range, extending from the Clear Lake watershed in the north to the Lake Berryessa watershed in the south and bordered by northwest-southeast trending ridgelines, and separated by the Lake-Napa county line. Topography is characterized by rolling hills and low mountains interspersed with valley areas adjacent to lakes and streams. Elevation ranges from approximately 440 to 4,700 feet above sea level. Irrigated agriculture occurs in a small portion of the Lake and Napa Subwatersheds, with approximately 20,000 acres (<2.5%) currently being farmed. Some dryland farming also occurs in a small proportion of walnut orchards and wine grape vineyards. Other land uses include non-irrigated rangeland, urban and rural residential development, and native woodlands, chaparral, grasslands, and wetlands.

The Lake and Napa Subwatersheds encompass eight drainages where irrigated agriculture is present. Table 5 lists the drainages by name and the crops grown within each drainage area. Figure 5 shows the extent of the drainages.

Table 5. Lake and Napa Subwatersheds Drainages and Crops

Type of Monitoring	Drainages	Crops
Monitoring site in Middle Creek	Upper Lake (Middle Creek) (Lake County)	Walnuts, pears, wine grapes, pasture
Represented by Middle Creek monitoring site	Lakeport	Walnuts, pears, wine grapes, pasture
	Lower Lake	Walnuts, pears, wine grapes, pasture
	Upper Putah Creek	Walnut, wine grapes, pasture
	Schindler Creek	Walnuts
	North Fork Cache Creek	Walnuts, wine grapes
Monitoring site in Pope Creek	Pope Creek (Napa County)	Wine grapes
Represented by Pope Creek monitoring site	Capell Creek	Wine grapes

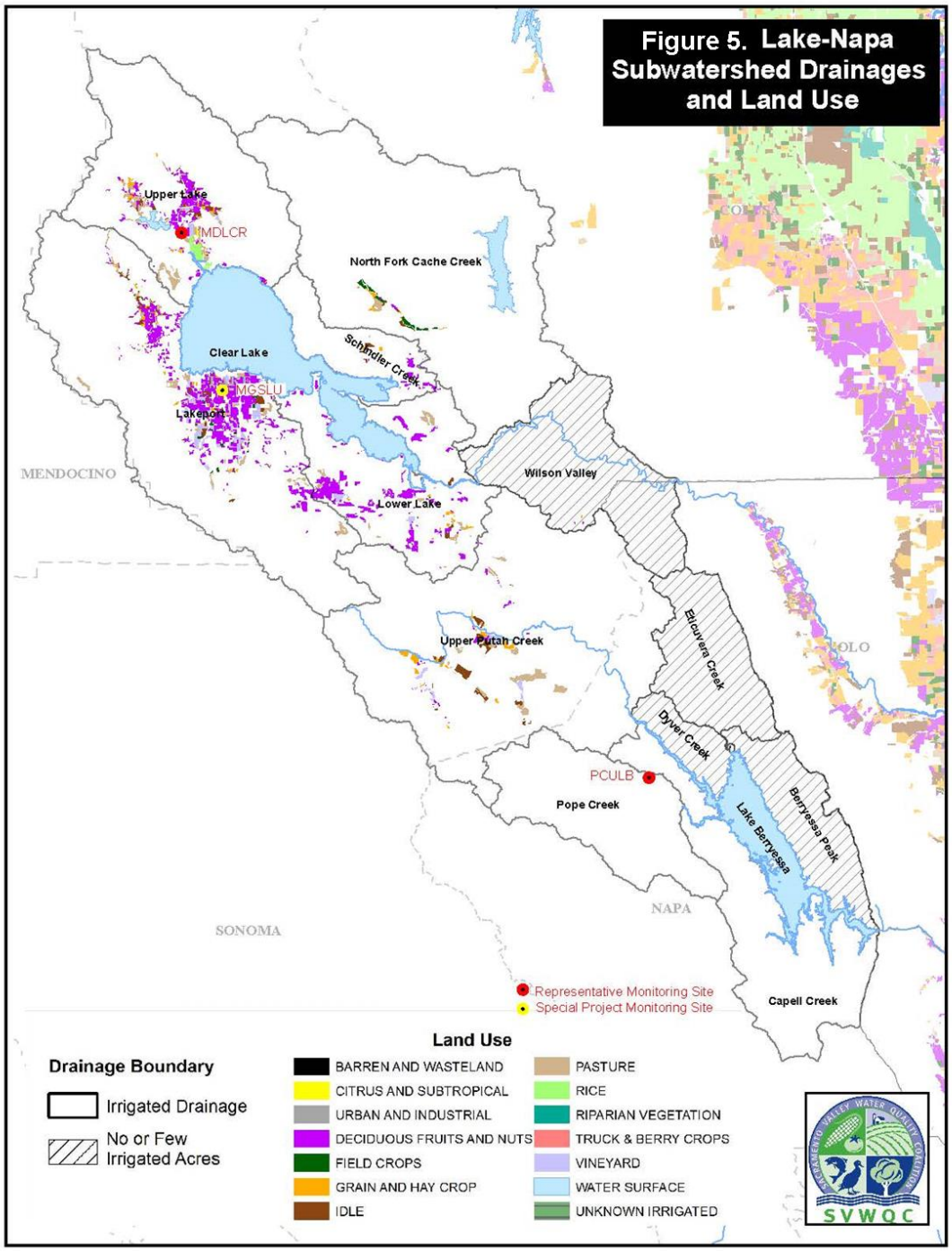


Figure 5. Lake-Napa Subwatershed Drainages and Land Use
Upper Lake
MDLCR
North Fork Cache Creek
Clear Lake
Schindler Creek
MGSLU
Lakeport
MENDOCINO
Wilson Valley
Lower Lake
Upper Putah Creek
Eticuvera Creek
Dyer Creek
PCULB
Pope Creek
Lake Berryessa
Berryessa Peak
NAPA
SONOMA
Capell Creek
Representative Monitoring Site
Special Project Monitoring Site
Land Use
Drainage Boundary
Irrigated Drainage
No or Few Irrigated Acres
BARREN AND WASTELAND
CITRUS AND SUBTROPICAL
URBAN AND INDUSTRIAL
DECIDUOUS FRUITS AND NUTS
FIELD CROPS
GRAIN AND HAY CROP
IDLE
PASTURE
RICE
RIPARIAN VEGETATION
TRUCK & BERRY CROPS
VINEYARD
WATER SURFACE
UNKNOWN IRRIGATED
SVWQC

Upper Pit River Subwatershed

The Upper Pit River Subwatershed encompasses approximately 2,767,000 acres, extending from the Warner Mountains along the South Fork Pit River, to Shasta Lake in Shasta County. The subwatershed includes portions of Modoc, Lassen and Shasta counties. The topography is characterized by mountainous terrain with elevations ranging from approximately 3,200 to 9,833 feet above sea level. The low gradient of valley floors throughout the watershed is attributed to the deposition of large amounts of volcanic material. Approximately 44% of the acreage is privately owned, with predominant uses in production agriculture (ranching, hay/alfalfa, and wild rice), timber, and livestock grazing, while 56% of the subwatershed is held by federal and state agencies. It is estimated that 152,196 irrigated acres of privately owned land are currently in production.

The Upper Pit River Subwatershed encompasses 23 main drainages where irrigated agriculture is present. Table 6 lists the drainages by name and the crops grown within each area. Figure 6 shows the location and relative extent of the drainages.

Table 6. Upper Pit River Subwatershed Drainages and Crops

Type of Monitoring	Drainages	Crops
Monitoring site in Pit River at Pittville	Big Lake	Pasture, rice, oats, wheat grain and hay, idle
Represented by Pit River at Pittville monitoring site	Bieber	Pasture, grain and hay, barley
	Alturas	Pasture, rice, oats, wheat, grain and hay, marsh
	Canby	Pasture, grain and hay, barley
	Lower Burney Creek	Pasture, rice, grain and hay, nursery, idle
	Upper Ash Creek	Pasture, grain and hay, barley, general field crops
	Lower Hat Creek	Pasture, nursery
	Little Valley	Pasture, idle
	Lake Britton	Pasture
	Cedar Creek	Pasture, grain and hay, barley
	Upper Burney Creek	Pasture
	Turner Creek	Pasture, grain and hay, barley, general field crops
	Montgomery Creek	Pasture
	Big Sage	Pasture, grain and hay, barley
	Hatchet Creek	Pasture
	Pondosa	Pasture
	Upper Hat Creek	Pasture
	Kosk Creek	Pasture
	Squaw Valley	Pasture
	Big Bend	Pasture
	Dunsmuir	Pasture
	Sweetbriar Creek	Pasture
	Lower McCloud River	Pasture

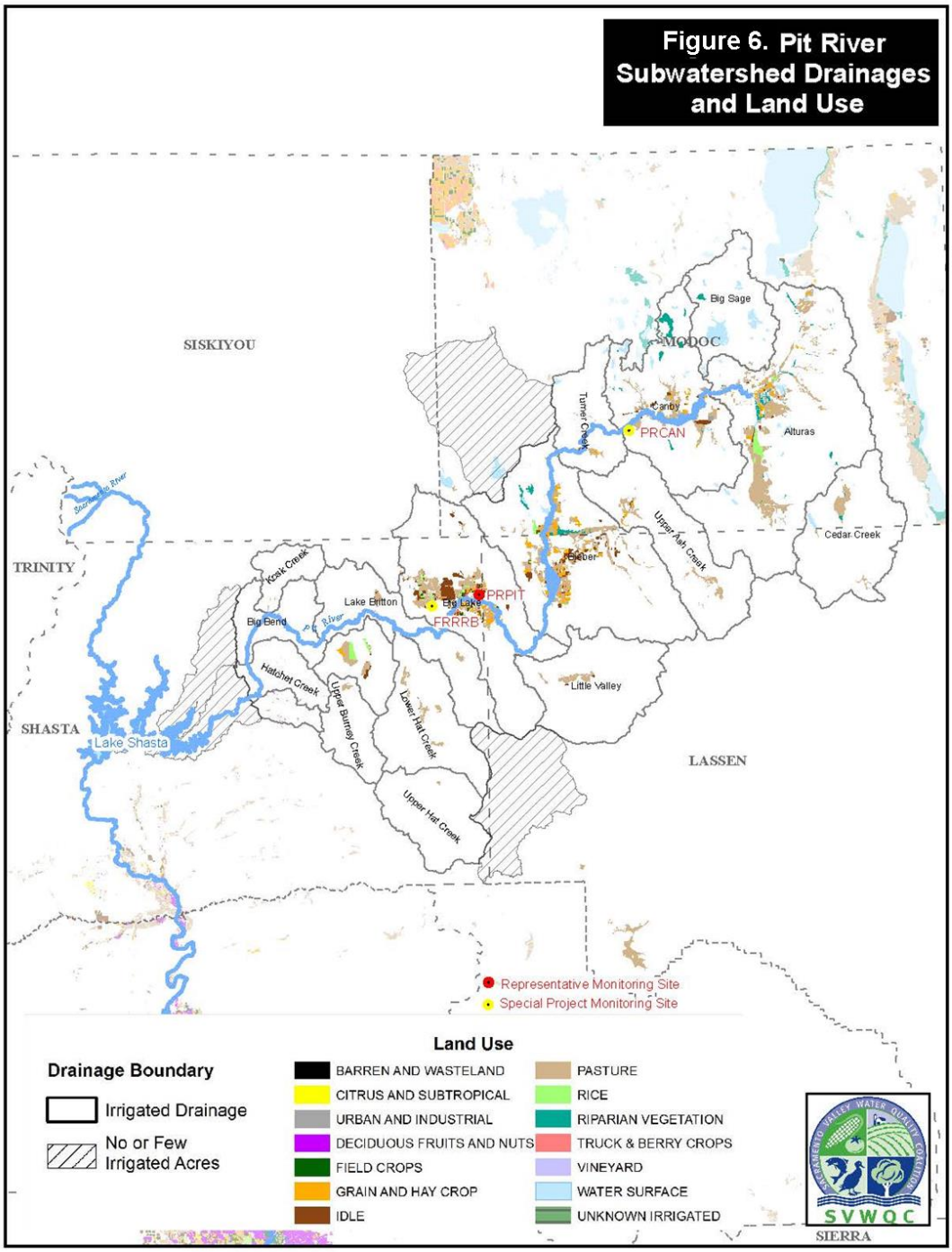


Figure 6. Pit River Subwatershed Drainages and Land Use
SISKIYOU
MODOC
Big Sage
Canby
PRCAN
Alturas
Turner Creek
Upper Ash Creek
Cedar Creek
Bieber
TRINITY
Kosk Creek
Lake Britton
Big Lake
PRPIT
FRRRB
Big Bend
Pit River
Hatchet Creek
Upper Burney Creek
Lower Hat Creek
Upper Hat Creek
Little Valley
SHASTA
Lake Shasta
LASSEN
SIERRA
Representative Monitoring Site
Special Project Monitoring Site
Land Use
Drainage Boundary
Irrigated Drainage
No or Few Irrigated Acres
BARREN AND WASTELAND
CITRUS AND SUBTROPICAL
URBAN AND INDUSTRIAL
DECIDUOUS FRUITS AND NUTS
FIELD CROPS
GRAIN AND HAY CROP
IDLE
PASTURE
RICE
RIPARIAN VEGETATION
TRUCK & BERRY CROPS
VINEYARD
WATER SURFACE
UNKNOWN IRRIGATED
SVWQC

Placer-Nevada-South Sutter-North Sacramento Subwatershed

The Placer-Nevada-South Sutter-North Sacramento (PNSSNS) Subwatershed encompasses approximately 1.17 million acres in the southeast portion of the Sacramento Valley, and includes most of Placer and Nevada Counties, and roughly one-fifth and one-quarter of Sutter and Sacramento counties, respectively. About 38% (447,000 acres) of the watershed (Gold Run, Blue Canyon, Hell Hole, Snow Mountain, Rubicon River, and Duncan Canyon drainages) has no irrigated acreage. In general, the subwatershed area is bounded on the east by the Sierra Nevada Range, on the west by the Yolo Causeway and the Sacramento River, on the north by the Yuba and Bear rivers, and on the south by the Rubicon River and the American River. Topography varies from a relatively flat valley floor, to rolling foothills and volcanic buttes, to steep forested mountains and deep river canyons. Elevation ranges from approximately 30 to 7,000 feet above sea level, although irrigated cropland does not generally occur above 3,000 feet. The majority of irrigated agriculture occurs in the southwest area of the PNSSNS Subwatershed, with approximately 162,000 acres currently being farmed, of which about 72,000 acres is in rice. Some dryland grains are also grown, typically in rotation with other field crops. Other land use types include non-irrigated grazing rangeland, urban and rural residential development, and coniferous forests, oak woodlands, grasslands, and wetlands.

The PNSSNS Subwatershed encompasses 16 different drainages where irrigated agriculture is present. Table 7 lists the drainages by name and the crops grown within each drainage area. Figure 7 shows the extent of the drainages.

Table 7. PNSSNS Subwatershed Drainages and Crops

Type of Monitoring	Drainages	Crops
Monitoring site in Coon Creek	Middle Coon Creek	Rice, pasture, grain, sudan, walnuts, corn
Represented by Coon Creek monitoring site	Lower Coon Creek	Rice, grain pasture, walnuts, corn
	Natomas	Rice, grain, corn
	Pleasant Grove Creek	Rice, grain, pasture, corn
	Coon Creek – Auburn	Pasture
	Dry Creek – Sacramento	Rice, pasture, grain
	Secret Ravine	Pasture
	Volcanoville	Walnuts
	Lake Clementine	Pasture, corn
	Camp Far West	Pasture, wine grapes
	Wolf Creek	Pasture
	Dry Creek – Nevada	Pasture, wine grapes
	Lower Bear River	Pasture, grain, rice
	Rollins Reservoir	Apples
	Shady Creek	Pasture, wine grapes
	New Bullards Bar	Pasture

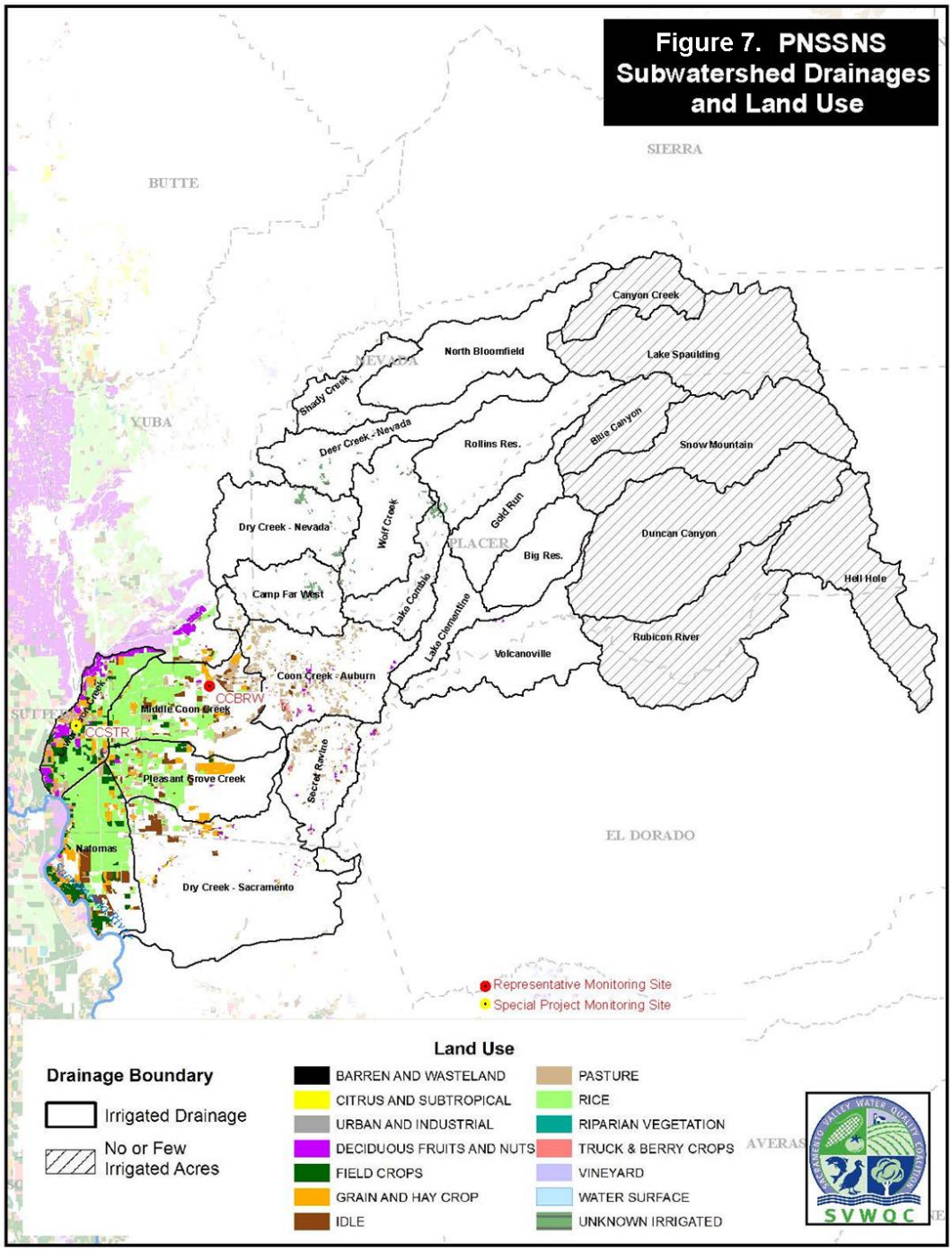


Figure 7. PNSSNS Subwatershed Drainages and Land Use
SIERRA
BUTTE
YUBA
SUTTER
PLACER
EL DORADO
Canyon Creek
North Bloomfield
Lake Spaulding
Shady Creek
Deer Creek - Nevada
Rollins Res.
Bitis Canyon
Snow Mountain
Dry Creek - Nevada
Wolf Creek
Gold Run
Duncan Canyon
Big Res.
Hell Hole
Camp Far West
Lake Combie
Lake Clementine
Rubicon River
Volcanoville
Coon Creek - Auburn
CCBRW
Middle Coon Creek
CCSTR
Pleasant Grove Creek
Secret Ravine
Natomas
Dry Creek - Sacramento
Representative Monitoring Site
Special Project Monitoring Site
Land Use
Drainage Boundary
Irrigated Drainage
No or Few Irrigated Acres
BARREN AND WASTELAND
CITRUS AND SUBTROPICAL
URBAN AND INDUSTRIAL
DECIDUOUS FRUITS AND NUTS
FIELD CROPS
GRAIN AND HAY CROP
IDLE
PASTURE
RICE
RIPARIAN VEGETATION
TRUCK & BERRY CROPS
VINEYARD
WATER SURFACE
UNKNOWN IRRIGATED
SVWQC

Sacramento-Amador Subwatershed

The Sacramento-Amador Subwatershed encompasses approximately 490,000 acres at the south end of the Sacramento Valley and contains roughly three-quarters of Sacramento County and half of Amador County. The subwatershed is generally bounded on the east by the Sierra Nevada foothills, on the west by the Sacramento River, on the north by the lower American River (in part) and the Cosumnes River (in part), and on the south by the Mokelumne River. Moving from west to east, the subwatershed's topography starts out relatively flat in the area of the Sacramento-San Joaquin Delta and alluvial floodplains; it then transitions to low rolling hills and dissected alluvial terraces, tabletop buttes, and escarpments; and ends up in rolling to steep foothills, mesa-like plateaus, and undulating flats and valleys. Elevations range from sea level to approximately 4,500 feet above sea level. Irrigated agriculture occurs in just over 15% of the Sacramento-Amador Subwatershed, with approximately 76,000 acres currently being farmed (Figure 9). Other land use types include non-irrigated rangeland, urban/rural residential development, and oak woodlands, grasslands, chaparral, and wetlands.

The Sacramento-Amador Subwatershed encompasses eight different drainages where irrigated agriculture is present. Table 8 lists the drainages by name and the crops grown within each drainage area. Figure 8 shows the extent of the drainages.

Table 8. Sacramento-Amador Subwatershed Drainages and Crops

Type of Monitoring	Drainages	Crops
Monitoring site in Cosumnes River	Lower Cosumnes River	Pasture, wine grapes, corn, grain, sudan, orchards (pears, cherries, apples, almonds, walnuts, peaches, nectarines, citrus, olives), strawberries
Represented by Cosumnes River monitoring site	Middle Cosumnes River	Wine grapes, pasture, corn, grain, sudan
	Elder Creek – Sacramento	Pasture, grain, hay
	Jackson Creek	Wine grapes, pasture, corn, grain
	North Fork Cosumnes River	Wine grapes, walnuts, pasture, grain
	Upper Deer Creek – Sacramento	Wine grapes, pasture
	Omo Ranch	Wine grapes, walnuts
Monitoring site in Grand Island	Grand Island (Delta)	Corn, grain, hay, wine grapes, pears, pasture

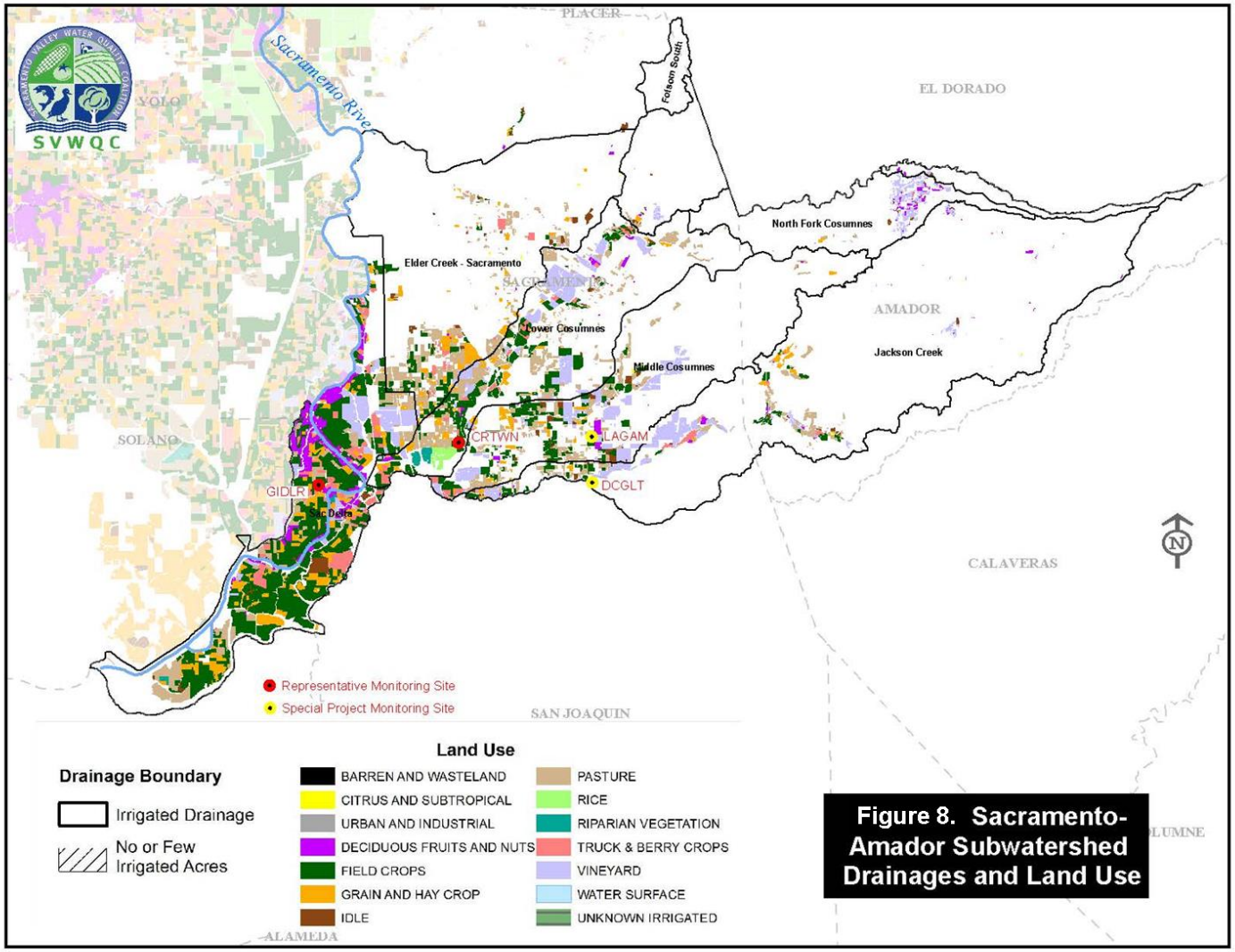


Figure 8. Sacramento-Amador Subwatershed Drainages and Land Use

Shasta-Tehama Subwatershed

The Shasta-Tehama Subwatershed is located in the north central part of California and encompasses approximately 2.7 million acres within Shasta and Tehama counties. These counties are contiguous from north to south and represent a hydrologic unit that is framed by Shasta Dam to the north and the political boundaries associated with Glenn and Butte counties to the south. The subwatershed area is bounded by the convergence of the Klamath and Coastal Mountain Ranges to the west and northwest and the Cascade Mountain Range to the east. The topography varies from the flat valley floor through rolling foothills up to rugged, steep mountains, with elevations ranging from approximately 300 to over 8,000 feet above sea level.

The irrigated acreage of the Shasta-Tehama Subwatershed is dominated by orchards, a diversity of field crops, and irrigated pasture for livestock. These crops comprise approximately 142,000 acres or a little more than 5% of the total acres in the subwatershed, located primarily in the floodplains of the Sacramento River and its tributaries.

The Shasta-Tehama Subwatershed encompasses 35 drainages where irrigated agriculture is present. Table 9 lists the drainages by name and the crops grown within each drainage area. Figure 9 shows the location and relative extent of the drainages.

Table 9. Shasta-Tehama Subwatershed Drainages and Crops

Type of Monitoring	Drainages	Crops
Monitoring Site	Anderson Creek	Pasture, Walnuts, Prunes, Olives, Almonds, Eucalyptus
Represented by Anderson Creek monitoring site	Rice/Burch Creek	Pasture, Walnuts, Prunes, Almond, Olives, Rice
	Elder Creek	Pasture, Walnuts, Prunes, Almond, Olives
	Kopta Slough	Pasture, Walnuts, Prunes, Almond, Olives
	Cottonwood Creek	Pasture, Walnuts, Prunes, Almond, Olives
	Salt Creek	Pasture, Walnuts, Prunes, Almond, Olives
	Thomes Creek	Pasture, Walnuts, Prunes, Almond, Olives
	Coyote Creek	Pasture, Walnuts, Prunes, Almond, Olives
	Red Bank Creek	Pasture, Walnuts, Prunes, Almond, Olives
	Antelope Creek	Pasture, Walnuts, Prunes, Olives, Eucalyptus
	Jewett Creek	Pasture, Walnuts, Prunes, Almond, Olives
	Vina-Hoag N/Dicus Slough	Pasture, Walnuts, Prunes, Almond, Olives, Grains, Safflower
	Capay (SE Birch Creek)	Pasture, Prunes, Almond, Olives, Eucalyptus
	McClure Creek	Pasture, Walnuts, Prunes, Olives, Eucalyptus
	Dry Creek – Tehama	Pasture, Walnuts, Prunes, Olives, Grains
	Cow Creek	Pasture, Walnuts, Grains
	Battle Creek	Pasture, Walnuts, Prunes, Eucalyptus, Grains
	Deer Creek – Tehama	Pasture, Walnuts, Prunes, Almond, Eucalyptus
	Stillwater Creek	Pasture, Walnuts, Almonds, Olives, Euralyptus
	Foster Island (NE Birch Ck)	Pasture, Walnuts, Prunes, Olives, Eucalyptus
	Dye Creek	Pasture, Walnuts, Prunes
	Mill Creek	Pasture, Walnuts, Prunes, Eucalyptus, General Field Crops
	Paynes Creek	Pasture, Walnuts, Prunes, Eucalyptus, Grain
	Paynes Slough	Pasture, Walnuts, Prunes, Almond, Grain, Wheat
	Reeds	Pasture, Olives, Grain, Kiwis, Plums
	Jelly School	Pasture, Walnuts, Prunes, Almonds, Eucalyptus
	Bear Creek	Pasture, Grain
	Lower Clear Creek	Pasture, Grain
	Dibble Creek	Pasture, Olives, Wheat
	Rancheria Creek	Pasture, Safflower, Strawberries
	Blue Tent Creek	Pasture, Grain
	Middle Clear Creek	Pasture
	Inks Creek	Pasture, Wheat

Type of Monitoring	**Drainages**	**Crops**
	Upper Clear Creek	Pasture
	North and adjacent Paynes Slough	Walnuts

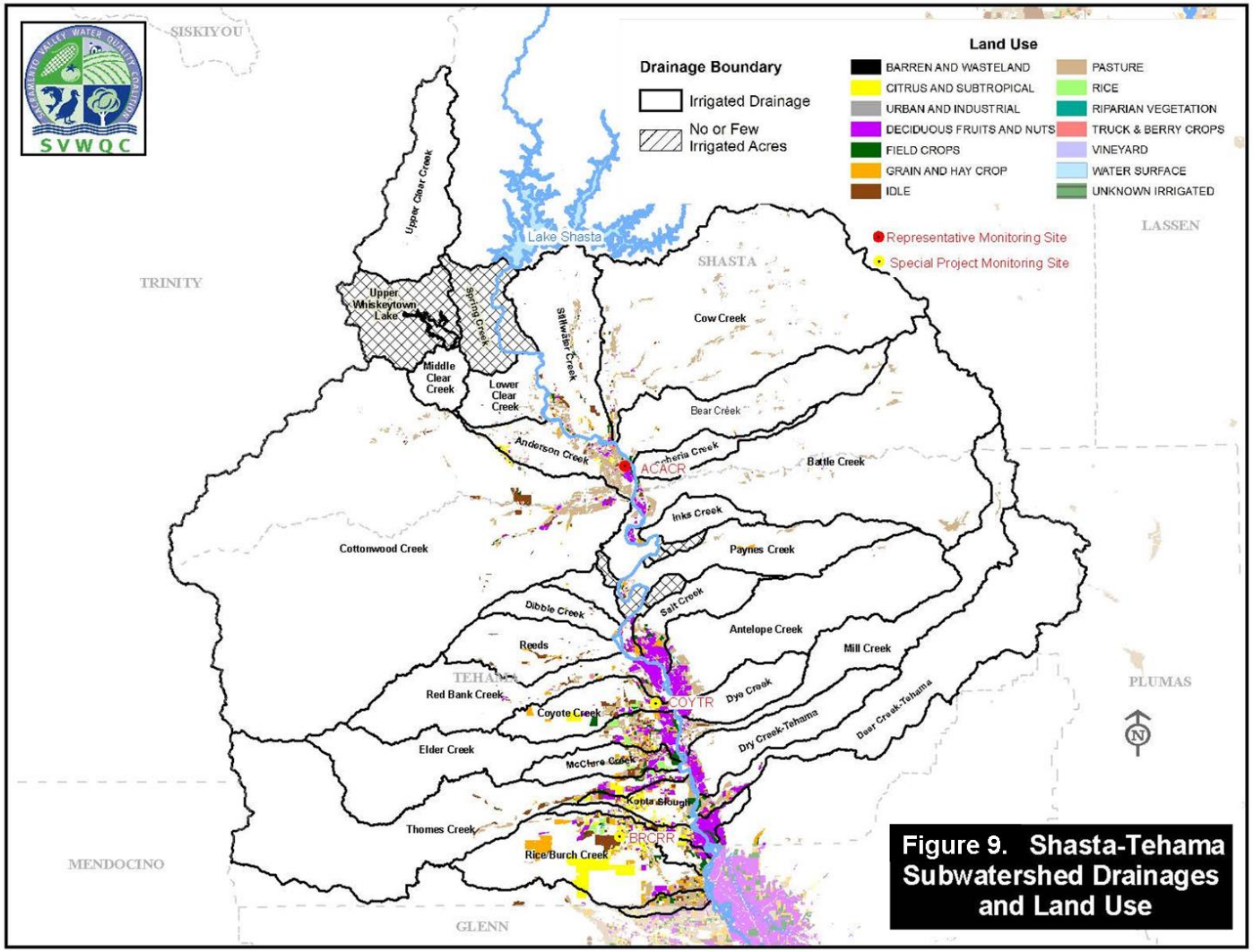


Figure 9. Shasta-Tehama Subwatershed Drainages and Land Use

Solano and Yolo Subwatersheds

The Solano and Yolo Subwatersheds encompass approximately 872,000 acres on the lower portion and west side of the Sacramento Valley, and include all of Yolo County south of Cache Creek and roughly half of Solano County. These subwatershed areas are bounded on the east by the Sacramento River, on the west by the California Coast Ranges, on the north by the Yolo County line, and on the south and southwest by sloughs and wetlands of the Grizzly Island area near the Delta. The two subwatersheds are separated by the Solano-Yolo county line. Topography varies from a nearly level or gently sloping landscape in the eastern region, to rolling hills in the southeast and steep mountainous terrain in the west. Elevation ranges from approximately 10 to 2,800 feet above sea level. The southern portion of Solano County contains a large area of tidal flats and marshland adjacent to Suisun Bay that has been cut into islands by a maze of natural drainage channels. Intensive irrigated agriculture occurs in large portions of the Solano and Yolo Subwatersheds, with approximately 518,000 acres currently being farmed, with about 14,000 acres in rice. Some dryland grains are also grown, typically in rotation with other field crops. Other land uses include non-irrigated rangeland, urban and rural residential development, and native woodlands, grasslands, and wetlands.

The Solano and Yolo Subwatersheds encompass eight main drainages where irrigated agriculture is present. Table 10 lists the drainages by name and the crops grown within each drainage area. Figure 10 shows the extent of the drainages.

Table 10. Solano and Yolo Subwatersheds Drainages and Crops

Type of Monitoring	Drainages	Crops
Monitoring site in Ulatis Creek	Cache Slough	Almonds, walnuts, tree fruits, wine grapes, corn, alfalfa, safflower, sunflower, wheat, melons, tomatoes, pasture, grain
Represented by Ulatis Creek monitoring site	Southwest Yolo Bypass	Almonds, walnuts, corn, alfalfa, safflower, sunflower, wheat, tomatoes, pasture, grain
	Putah Creek South	Almonds, walnuts, tree fruits, wine grapes, corn, alfalfa, safflower, sunflower, wheat, melons, tomatoes, pasture, grain
	Sacramento River-Solano	Grain, safflower, pasture
Monitoring site in Willow Slough	Willow Slough	Grain, alfalfa, pasture, corn, tomatoes, rice, walnuts, almonds, wheat, sunflower, prunes,
Represented by Willow Slough monitoring site	Cache Creek	Almonds, walnuts, prunes, corn, alfalfa, rice, safflower, sunflower, wheat, melons, tomatoes, pasture, grain
	North Yolo Bypass	Grain, tomatoes, corn, rice, pasture, safflower
	Buckeye Creek	Almonds, tomatoes, pasture, grain
	Bird Creek	Grain, rice, melons/squash, corn
	Smith Creek	Tomatoes, grain, pasture, corn, rice, melons, squash
	Breton Creek	Grain, pasture, rice, tomatoes, safflower
	Oat Creek	Grain, rice, safflower, pasture, melons/squash
	Meridian Edge	Grain, melons/squash, cotton, tomatoes
	South Yolo Bypass	Corn, alfalfa, rice, safflower, sunflower, tomatoes, pasture, grain

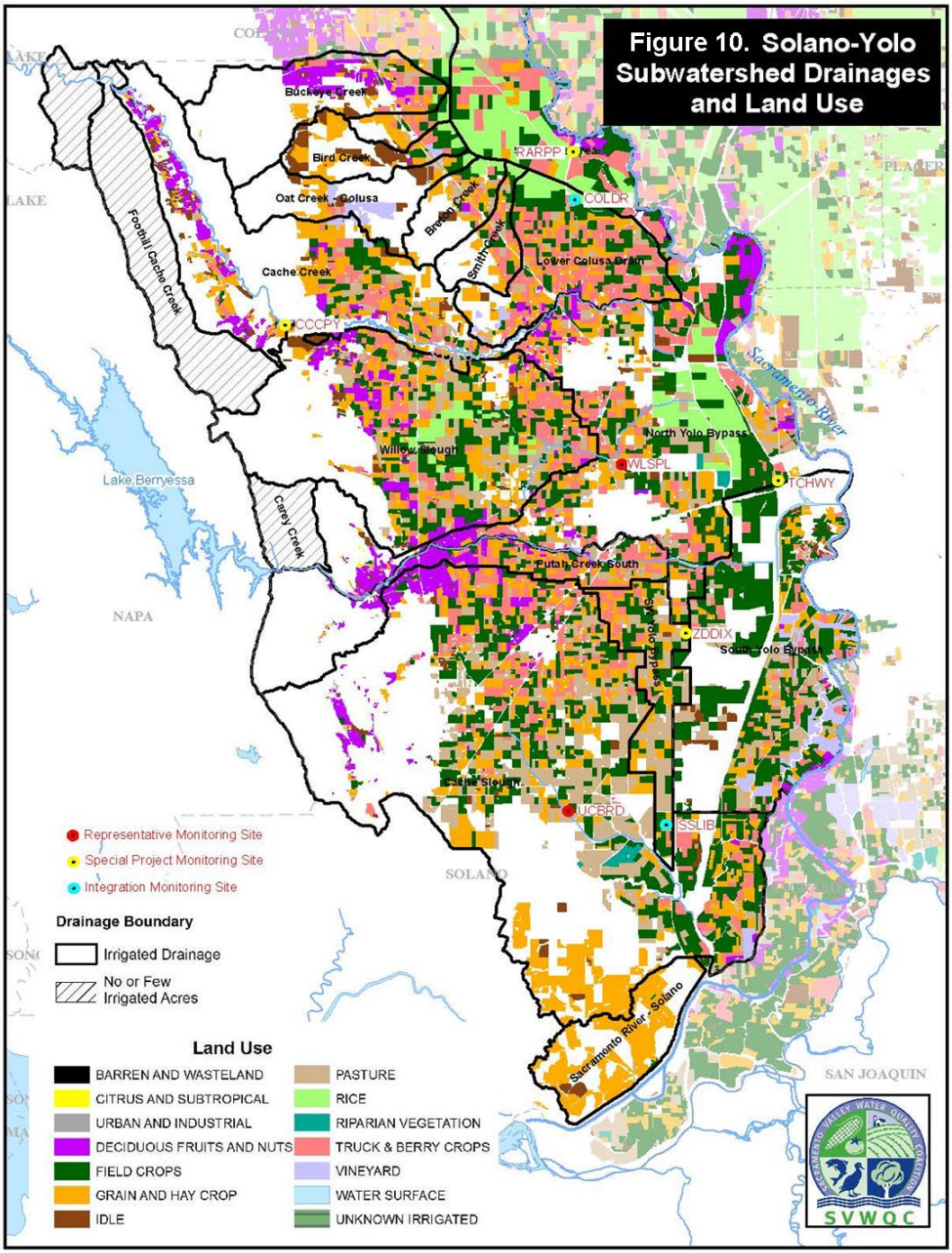


Figure 10. Solano-Yolo Subwatershed Drainages and Land Use
Buckeye Creek
Bird Creek
Oat Creek - Colusa
Foothill Cache Creek
Cache Creek
Breeds Creek
Smith Creek
Lower Colusa Drain
RARPP
COLDR
CCCPY
Sacramento River
North Yolo Bypass
Willow Slough
WLSPL
TCHWY
Lake Berryessa
Carey Creek
Putah Creek South
Solano Bypass
ZDDIX
South Yolo Bypass
Cache Slough
UCBRD
SSLIB
Sacramento River - Solano
LAKE
NAPA
SOLANO
SAN JOAQUIN
PLACER
Representative Monitoring Site
Special Project Monitoring Site
Integration Monitoring Site
Drainage Boundary
Irrigated Drainage
No or Few Irrigated Acres
Land Use
BARREN AND WASTELAND
CITRUS AND SUBTROPICAL
URBAN AND INDUSTRIAL
DECIDUOUS FRUITS AND NUTS
FIELD CROPS
GRAIN AND HAY CROP
IDLE
PASTURE
RICE
RIPARIAN VEGETATION
TRUCK & BERRY CROPS
VINEYARD
WATER SURFACE
UNKNOWN IRRIGATED
SVWQC

Upper Feather River Subwatershed

The Upper Feather River Subwatershed encompasses an area of approximately 3,222 square miles that drains west from the northern Sierra Nevada through Lake Oroville and the Feather River to the Sacramento River. The topography is characterized by mountainous terrain with elevations that range from 2,250 to over 10,000 feet above sea level, and annual precipitation that varies broadly from 70 inches on the western slopes to less than 12 inches on the arid east side. The Plumas National Forest manages approximately 50% of the watershed, while alluvial valleys are predominantly privately owned with the dominant land use being livestock grazing. Agriculture accounts for 3.5% of land use in Plumas County and 6.7% of land use in Sierra County within the Upper Feather River Subwatershed region.

The Upper Feather River Subwatershed is uniquely divided into three distinct agricultural valleys located in Plumas and Sierra Counties: the Sierra Valley, the Indian Valley and the American Valley. Parallel lying valleys separated by low elevation ridges are common throughout the subwatershed. These valleys once contained ancient lakes that are now alluvial meadow systems.

The Upper Feather River Subwatershed encompasses four main drainage areas. Table 11 lists the drainages by name and the crops grown within each area. Figure 11 shows the extent of the drainages.

Table 11. Upper Feather River Subwatershed Drainages and Crops

Type of Monitoring	Drainages	Crops
Monitoring site in Middle Fork Feather River	Middle Fork Feather River Sierra Valley	Pasture, alfalfa, grass hay, grain hay, nursery, Xmas trees
Monitoring site in Spanish Creek	North Fork Feather River American Valley	Pasture, alfalfa, grass hay, oats, wheat
Monitoring site in Indian Creek	North Fork Feather River Indian Valley	Pasture, alfalfa, grass hay, oats, wheat

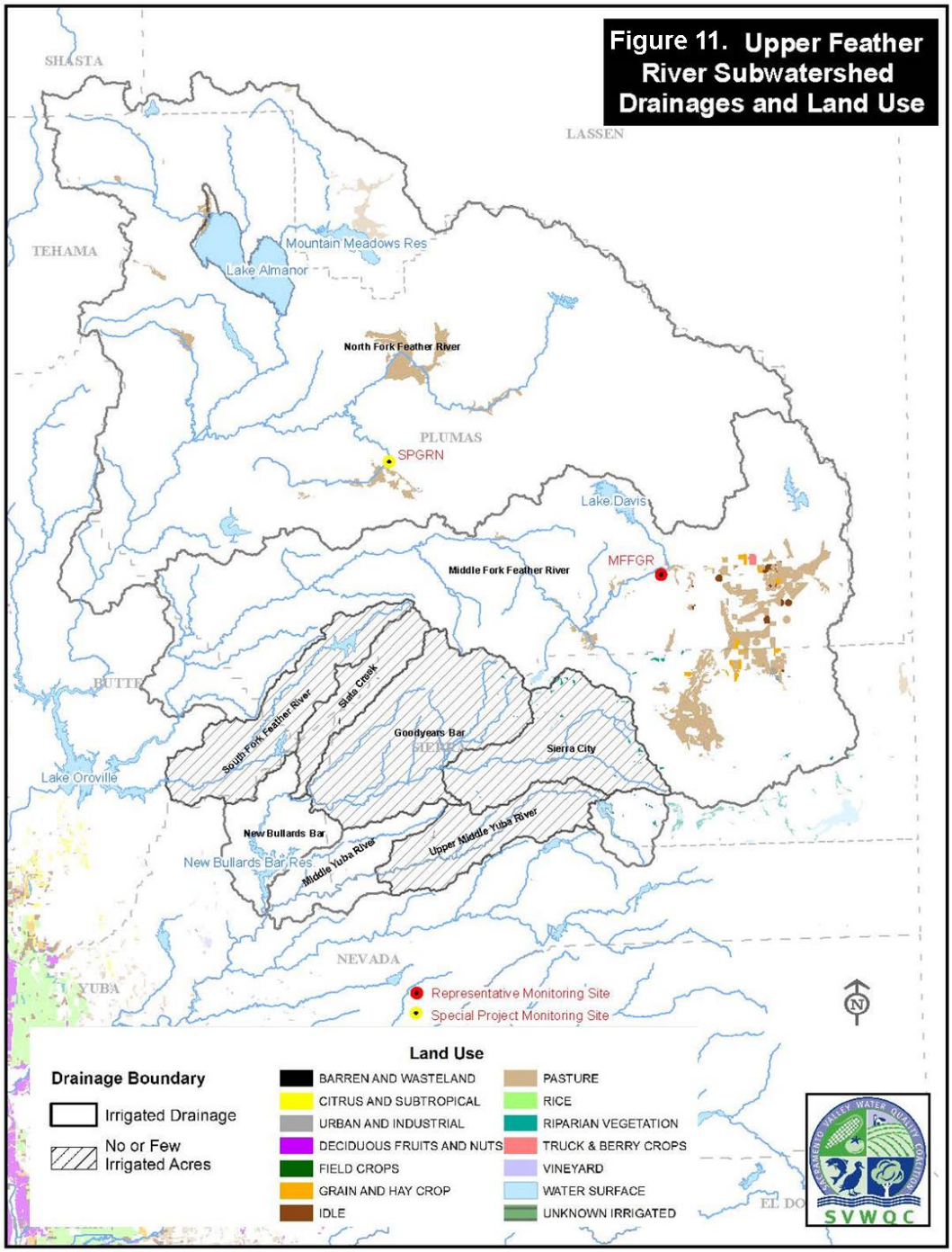


Figure 11. Upper Feather River Subwatershed Drainages and Land Use
SHASTA
LASSEN
TEHAMA
Mountain Meadows Res
Lake Almanor
North Fork Feather River
PLUMAS
SPGRN
Lake Davis
Middle Fork Feather River
MFFGR
BUTTE
Slate Creek
South Fork Feather River
Goodyears Bar
Sierra City
Lake Oroville
New Bullards Bar
New Bullards Bar Res
Middle Yuba River
Upper Middle Yuba River
NEVADA
YUBA
Representative Monitoring Site
Special Project Monitoring Site
Land Use
Drainage Boundary
Irrigated Drainage
No or Few Irrigated Acres
BARREN AND WASTELAND
CITRUS AND SUBTROPICAL
URBAN AND INDUSTRIAL
DECIDUOUS FRUITS AND NUTS
FIELD CROPS
GRAIN AND HAY CROP
IDLE
PASTURE
RICE
RIPARIAN VEGETATION
TRUCK & BERRY CROPS
VINEYARD
WATER SURFACE
UNKNOWN IRRIGATED
SVWQC

Goose Lake Subwatershed

The Goose Lake Basin watershed has been managed for the ILRP through an independent water quality coalition by the Goose Lake Resource Conservation District. Under the current Order (R5-2014-XXXX) this watershed is included in the Sacramento River Watershed.

The Goose Lake Basin watershed stretches across the border between northeastern California and south-Central Oregon. This high desert watershed encompasses 1,140 square miles of land that drains from both the west and the east into Goose Lake, a closed-basin lake system that no longer has a surface outlet to the nearby Pit River. A low, gravelly terrace separates the lake from a marshy meadow. Most of the significant perennial tributary creeks within the California portion of the basin flow westward out of the Warner Mountains toward Goose Lake which itself covers thirteen percent of the entire area of the basin. Elevations within the watershed range from 8,000 feet in the Warner Mountains down to 4,693 feet at average lake level.

Within the California portion of the basin, Lassen and Willow Creek are the major water bodies that flow into Goose Lake. Six additional creeks (Cottonwood, Barnes, Davis, Roberts, Linnville, and Franklin) never reach the lake but instead end in terminal wetlands. These creeks and their tributaries are important for aquatic habitat benefits and aesthetic quality, in addition to contributing to local supplies for agricultural uses. Beneficial uses that have been identified for Goose Lake itself include livestock watering, salmonid fish rearing (for trout), aquatic habitat, aesthetic quality, wildlife and hunting.

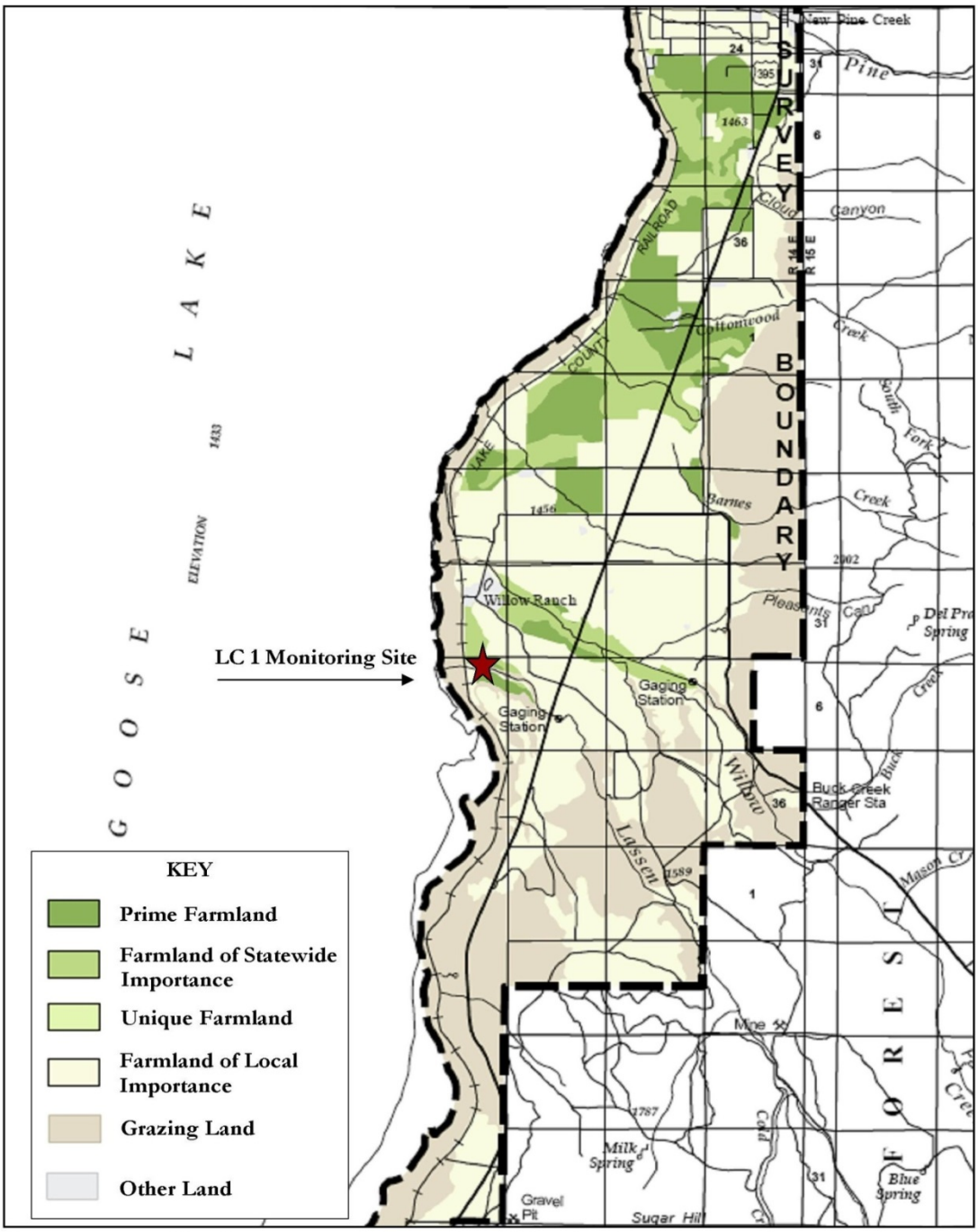
There are approximately 7,314 irrigated agricultural acres within the California portion of the Goose Lake Basin. Center-pivot, wheel-line sprinklers and controlled flooding are the current irrigation practices used within the watershed. While a majority of irrigation water is diverted from the basin's creeks flowing out of the Warner Mountains, there are also supplemental wells throughout the watershed that pump from underground aquifers to supplement the surface flow diversions. In low water or drought years, the amount of supplemental water provided by these wells is significant.

Within the California portion of the Goose Lake Basin, approximately 50 percent of the land is privately owned, with land use having changed little over the last 70 years. Private lands are used predominately for livestock grazing, but are also important for both irrigated and dryland hay production. Major crops types include alfalfa hay, orchardgrass hay, native meadow hay, and irrigated pasture. The remainder of the land is publicly owned and is predominately managed by the U.S. Forest Service and the Bureau of Land Management (BLM). These public lands are managed for multiple-use with livestock grazing and dispersed recreation being two of the most predominant uses. Overall, less than four percent of the land area of the basin is cultivated, while fertilizer and pesticide use is minimal.

Goose Lake Monitoring

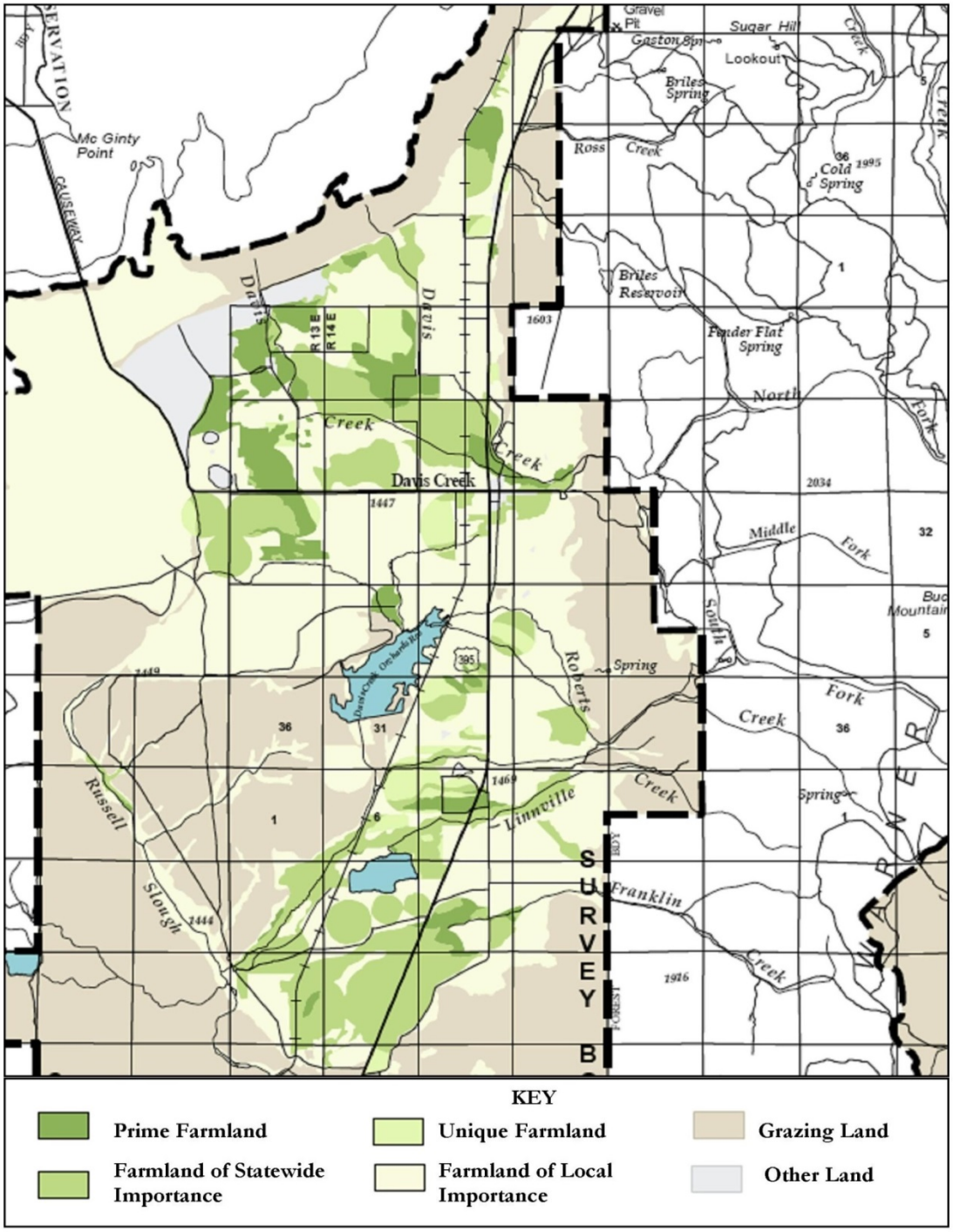
The primary site for the Coalition's Core Monitoring program continues to be the Lower Lassen Creek (LC 1) sampling site which is located below all irrigated agriculture activities in the Lassen Creek watershed. Because the agriculture, irrigation, and management practices are homogeneous throughout the Goose Lake Basin, the Regional Water Board approved the LC 1 site in 2008 as being representative of the Coalition's area as a whole.

Figure 12. Irrigated land in the Goose Lake subwatershed, north area.



Base map source: California Department of Conservation, Division of Land Resource Protection, Farmland Mapping and Monitoring Program, 2008. www.conservation.ca.gov

Figure 13. Irrigated land in the Goose Lake subwatershed, south area.



Base map source: California Department of Conservation, Division of Land Resource Protection, Farmland Mapping and Monitoring Program, 2008. www.conservation.ca.gov

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
CENTRAL VALLEY REGION

ATTACHMENT C TO ORDER R5-2014-0030-06
CEQA MITIGATION MEASURES

WASTE DISHARGE REQUIREMENTS GENERAL ORDER
FOR
GROWERS WITHIN THE SACRAMENTO RIVER WATERSHED
THAT ARE MEMBERS OF A THIRD-PARTY GROUP

A. Cultural Resources

1. 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.[1] Avoidance of such impacts also can be achieved when Members choose the least impactful management practices that will meet the quality improvement goals and objectives of Waste Discharge Requirements General Order for Growers within the Sacramento River Watershed that are Members of a Third-Party Group, Order R5-2014-0030-06 (hereafter referred to as the "Order"). 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 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 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).

[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

- Implement the recommendations provided by the CHRIS information center(s) in response to the records search request.
- Where adverse effects 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) 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.

Members 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 land owner 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.

B. Vegetation and Wildlife

1. 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 irrigated lands would minimize effects 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, Members 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 detention basins are to be abandoned, retain the basin in its existing condition or ensure that sensitive biological resources are not present before modification.
- 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 effects 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.

2. Mitigation Measure BIO-MM-2: Determine Extent of Wetland Loss and Compensate for Permanent Loss of Wetlands

Prior to implementing any management practice that will result in the permanent loss of wetlands, conduct a delineation of affected wetland areas to determine the acreage of loss in accordance with current U.S. Army Corps of Engineers (USACE) methods. For compliance with the federal Clean Water Act section 404 permit and WDRs protecting state waters from unauthorized fill, compensate for the permanent loss (fill) of wetlands and ensure no net loss of habitat functions and values. Compensation ratios will be determined through coordination with the Central Valley Water Board and USACE as part of the

permitting process. Such process will include additional compliance with CEQA, to the extent that a further discretionary approval by the board would require additional CEQA review. Compensation may be a combination of mitigation bank credits and restoration/creation of habitat, as described below:

- Purchase credits for the affected wetland type (e.g., perennial marsh, seasonal wetland) at a locally approved mitigation bank and provide written evidence to the resource and regulatory agencies, as needed, that compensation has been established through the purchase of mitigation credits.
- Develop and ensure implementation of a wetland restoration plan that involves creating or enhancing the affected wetland type.

C. Fisheries

1. 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), Members 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. 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 effects 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.

2. Mitigation Measure FISH-MM-2: Educate Members on the Use of Polyacrylamides (PAMs) for Sediment Control

The third-party will provide information on the potential risks to aquatic life, including special-status fish, that may result from the use of cationic or neutral PAMs during water management activities. Information in the form of leaflets and website information will be provided to Member, encouraging the use of anionic PAMs. Application of anionic PAMs at

prescribed rates will be emphasized in the information provided to Members. Adoption of the United States Department of Agriculture National Conservation Practice Standard 450 also will be recommended in the information.

D. Agriculture Resources

1. Mitigation Measure AG-MM-1: Assist the Agricultural Community in Identifying Sources of Financial Assistance that would Allow Members to Keep Important Farmland in Production.

The third-party will assist the agricultural community in identifying sources of financial assistance from existing federal, state, or local programs that promote water conservation and water quality through improved management practices. Funding received from grants, cost-sharing, or low interest loans would offset some of the local Members' expenditures for compliance with and implementation of the Order, and likely would reduce the estimated losses in irrigated acreage. Potential funding sources for this mitigation measure are discussed below. The programs described below are illustrative and are not intended to constitute a comprehensive list of funding sources.

Federal Farm Bill

Title II of the 2014 Farm Bill (the Agriculture Act of 2014, in effect through 30 September 2018) authorizes funding for conservation programs such as the Environmental Quality Incentives Program (EQIP) and the Conservation Stewardship Program. Both of these programs provide financial and technical assistance for activities that improve water quality on agricultural lands.

State Water Resources Control Board

The Division of Financial Assistance administers water quality improvement programs for the State Water Resources Control Board (State Water Board). The programs provide grant and loan funding to reduce non-point-source pollution discharge to surface waters.

The Division of Financial Assistance currently administers two programs that improve water quality associated with agriculture—the Agricultural Drainage Management Loan Program and the Agricultural Drainage Loan Program. Both of these programs were implemented to address the management of agricultural drainage into surface water. The Agricultural Water Quality Grant Program provides funding to reduce or eliminate the discharge of non-point-source pollution from agricultural lands into surface water and groundwater. It currently is funded through bonds authorized by Proposition 84.

The State Water Board's Clean Water State Revolving Fund also has funding authorized through Proposition 84. It provides loan funds to a wide variety of point-source and non-point-source water quality control activities.

Potential Funding Provided by the Safe, Clean, and Reliable Drinking Water Supply Act

This act was placed on the ballot by the Legislature as SBX7-2 and was originally scheduled for voter approval in November 2010. In August of 2010, the Legislature removed this issue from the 2010 ballot with the intent to re-introduce it in November of 2012. In July 2012, the Legislature approved a bill to take the measure off the 2012 ballot and put it on the 2014 ballot. If approved by the public, the new water bond would provide grant and loan funding for a wide range of water-related activities, including improving agricultural water quality, conservation and watershed protection, and groundwater protection and water quality. The majority of public funds allocated by the bond would go through a rigorous competitive process to ensure dollars would go to a public benefit. Additionally, this water bond is expected to leverage more than $30 billion in additional investments in local, regional, and state wide infrastructure for water supply, water quality, and environmental restoration enhancements. The actual amount and timing of funding availability will depend on its passage, on the issuance of bonds and the release of funds, and on the kinds of programs and projects proposed and approved for funding.

Other Funding Programs

Other state and federal funding programs have been available in recent years to address agricultural water quality improvements. Integrated Regional Water Management grants were authorized and funded by Proposition 50 and now by Proposition 84. These are administered jointly by the State Water Board and the California Department of Water Resources. Proposals can include agricultural water quality improvement projects. The Bureau of Reclamation also can provide assistance and cost-sharing for water conservation projects that help reduce discharges.

E. 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 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

ORDER R5-2014-0030-06
ATTACHMENT D TO ORDER R5-2014-0030-06
FINDINGS OF FACT AND STATEMENT OF OVERRIDING CONSIDERATIONS

WASTE DISCHARGE REQUIREMENTS GENERAL ORDER
FOR
GROWERS WITHIN THE SACRAMENTO RIVER WATERSHED
THAT ARE MEMBERS OF A THIRD-PARTY GROUP

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Acronyms and Abbreviations

2014 Farm Bill	Agriculture Act of 2014
CACs	county agricultural commissioners
CCR	California Code of Regulations
Central Valley Water Board	California Regional Water Quality Control Board, Central Valley Region
CEQA	California Environmental Quality Act
CRHR	California Register of Historic Resources
CV-SALTS	Central Valley Salinity Alternatives for Long-Term Sustainability
DO	dissolved oxygen
DPH	California Department of Public Health
DPM	diesel particulate matter
DPR	California Department of Pesticide Regulation
EIR	environmental impact report
EPA	U.S. Environmental Protection Agency
EQIP	Environmental Quality Incentives Program
ESA	federal Endangered Species Act
PEIR	Long-Term Irrigated Lands Regulatory Program Final Program EIR (incorporates Draft)
GHGs	greenhouse gasses
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
MMRP	Mitigation Monitoring and Reporting Program
NAHC	Native American Heritage Commission
NMFS	National Marine Fisheries Service
NPS	nonpoint source
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
PRC	California Public Resources Code
SB	Senate Bill
State Water Board	State Water Resources Control Board
TACs	toxic air contaminants
TMDLs	total maximum daily loads
USACE	U.S. Army Corps of Engineers
USFWS	U.S. Fish and 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 Growers within the Sacramento River Watershed that are Members of a Third-party, Order R5-2014-0030-06 (Order). The Order is described in California Regional Water Quality Control Board, Central Valley Region Order R5-2014-0030-R2 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 R5-2014-0030-R2 (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 irrigated lands in the Sacramento River Watershed. 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.

[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.

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.”

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, and for the Tulare Lake Basin Area in September 2013. 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 water quality management practices analyzed include:

- Nutrient management
- Improved water management

- Tailwater recovery system
- Pressurized irrigation
- Sediment trap, hedgerow, or buffer
- Cover cropping or conservation tillage
- 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 Members 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 River Watershed 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, and 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; sediment and erosion control plan (under Alternative 3, “farm plan”) recommendation/ certification requirements similar to Alternative 3; prioritized installation of groundwater monitoring wells similar to Alternative 5; and a prioritization system based on systems described by Alternatives 2 and 4.

C. Impact Findings

1. <u>Cultural Resources</u>

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.

Rationale for Finding
Upon implementation of the Order, Members 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 Members 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 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, including, installation of groundwater monitoring wells. The location of monitoring wells, as well as the location, timing, and specific suite of management practices to be selected by Members are not known at this time, and 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 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 the Order 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.

Operation of new well pumps as part of tailwater recovery systems may result in increased noise levels relative to existing conditions. 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-1and NOI-MM-2 are within the responsibility and jurisdiction of local agencies, who can and should implement these measures.

3. <u>Air Quality</u>

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 impacts 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. The management practices fitting this description include sediment trap, hedgerow, or buffer; pressurized irrigation; and tailwater recovery systems.

While it is anticipated that any emissions resulting from construction activities would be minuscule 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 at the end of the *Impact Findings* section, 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 third-party groups to perform surface water and groundwater monitoring, and from new diesel-powered pumps installed as part of tailwater recovery systems.

Any new emissions generated under the Order are not expected to be substantial or to exceed applicable air district thresholds. In addition, they may be moderated by emissions benefits related to management practices that reduce irrigation and cover crops (see Table 5.5-8 of the PEIR). 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 Members 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 the *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. <u>Vegetation and Wildlife</u>

Impact BIO-1. Loss of Downstream Habitat from Reduced Field Runoff (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, management practices that reduce field runoff would result in beneficial impacts on water quality but may adversely affect downstream wildlife and vegetation that depend on agricultural surface runoff. These practices cause water to be recirculated or used at an agronomic rate, resulting in a minimal amount of agricultural runoff. This would result in a net loss of water entering waterways and potential habitat loss along runoff ditches and downstream water bodies.

Such habitat would be seasonally present, available only during times of irrigation, and unlikely to support sensitive communities or special-status plants. While reduced runoff leads to, or is the result of, reduced surface water diversions to fields, some regions rely largely on groundwater to irrigate. While it is anticipated that the loss of sensitive communities or special-status plants resulting from reduced runoff 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-2: 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 measures are included in the *Mitigation Measures* section II.D.4.

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 construction of water and sediment control basins, temporary water checks, tailwater return systems, vegetated drain systems, windbreaks, wellhead protection berms, and filter strips. 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 agricultural lands and managed wetlands, which are unlikely to support native vegetation or special-status plants. However, construction that directly or indirectly affects natural vegetation communities adjacent to existing irrigated 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 measures are described in the *Mitigation Measures* section II.D.4.

Impact BIO-4. Potential Loss of Wetland Communities due to Loss of Existing Sedimentation Ponds (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, the assumed decrease in the use of surface water management practices that may be harmful to groundwater could result in abandonment or fill of tailwater sedimentation ponds in areas that currently percolate water to groundwater basins. Although they are not natural features, sedimentation ponds can develop vegetation communities that support wetland species, depending on the specific hydrologic regime of individual ponds. Ponds that hold water intermittently or seasonally may support plant species adapted to seasonal wetland conditions, and ponds that are continually flooded may support emergent vegetation adapted to permanent wetland conditions. Thus, the loss of these ponds could result in drying of artificially created wetlands and an indirect loss of wetland habitat. The loss of wetland communities resulting from abandonment or fill of retention ponds would be small but cannot be quantified. It is also important to note that implementation of one of the potential management practices under the Order—installation of tailwater return systems—would result in creation of tailwater ponds that could develop the same wetland characteristics as the abandoned or filled sedimentation ponds. Creation of new tailwater ponds could result in no net loss or potentially an increase in these wetland communities. However, the final extent of the tailwater ponds that could be created under the Order cannot be quantified. Consequently, the loss of existing sedimentation ponds is considered a potentially significant impact. **Mitigation Measure BIO-MM-2: Determine Extent of Wetland Loss and Compensate for Permanent Loss of Wetlands** has been incorporated into the Order to reduce this impact to a less-than-significant level. Mitigation measures are described in the *Mitigation Measures* section II.D.4.

Impact BIO-5. Impacts to Special-Status Wildlife Species due to Loss of Existing Sedimentation Ponds (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, the assumed decrease in the use of surface water management practices that may be harmful to groundwater could result in abandonment or fill of tailwater sedimentation ponds in areas that currently percolate water to groundwater basins. Although they are not natural features, sedimentation ponds can provide habitat for special-status wildlife species. The banks of these ponds could support habitat for special-status burrowing wildlife species, including giant garter snake and western burrowing owl. Ponds that hold water intermittently or seasonally may support special-status wildlife species adapted to seasonal wetland conditions, such as vernal pool fairy shrimp and vernal pool tadpole shrimp, California red-legged frog, and California tiger salamander, depending on the proximity of these ponds to natural habitats. The ponds also provide foraging habitat for many bird species. Ponds that hold water intermittently provide foraging habitat for wading birds, and ponds that are continually flooded may support foraging and nesting habitat for waterfowl. The abandonment or fill of retention ponds would be small and cannot be quantified but could affect wildlife species that are dependent on them. However, the creation of new tailwater ponds could mitigate part or all of this impact. Because the extent of new tailwater ponds cannot be quantified, the loss of existing sedimentation ponds 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 measures are 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 effect 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 sensitive natural communities and special-status plants cannot be quantified.
In general, management practices would be implemented on existing agricultural lands and managed wetlands, resulting in a less-than-significant impact. It was assumed that groundwater monitoring well placement also could be primarily limited to agricultural land and non-sensitive habitat. 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 irrigated 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 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 measures are 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 effect 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 agricultural lands and managed wetlands, resulting in a less-than-significant impact. It was assumed that placement of groundwater monitoring wells also could be limited primarily to agricultural land and non-sensitive habitat. However, construction of groundwater monitoring wells that requires changes to managed wetlands or to natural vegetation communities adjacent to existing irrigated lands could result in a loss of special-status wildlife species occurring in the uncultivated or unmanaged areas. While it is anticipated that the loss of 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. Mitigation measures are described at 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 River Watershed. These physical changes primarily include erosion and sediment controls with features such as construction of water and sediment control basins, temporary water checks, tailwater return systems, vegetated drain systems, windbreaks, wellhead protection berms, and filter strips. Physical changes may be associated with implementation of other management practices, such as construction of filter ditches for pesticide management. Installation of facilities for management practices such as pressurized irrigation and sediment traps 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 measures are 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) could be an issue where tailwater augments natural flows or makes seasonal streams into perennial systems. This may be of concern in areas where tailwater return flows are composed mostly of pumped groundwater. 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 are described in the *Mitigation Measures* section II.D.5.

Impact FISH-4. Toxicity to Fish or Fish Prey from Particle-Coagulant Water Additives (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, polyacrylamides (PAMs) may be applied to reduce erosion and sediment runoff and thereby improve water quality (Sojka et al. 2000). Anionic PAMs are safe to aquatic life when used at prescribed rates (Sojka et al. 2000). Because neutral and cationic PAMs may be toxic to fish and their prey (Sojka et al. 2000; Mason et al. 2005), application of anionic PAMs is recommended in areas with sensitive fish species (Mason et al. 2005). This impact is considered potentially significant. **Mitigation Measure FISH-MM-2: Educate Growers on the Use of Polyacrylamides (PAMs) for Sediment Control** has been incorporated into the Order to reduce this impact to a less-than-significant level. Mitigation measures are 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 effect 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. Mitigation measures are 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 effect 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 measures are described in the *Mitigation Measures* section II.D.5.

6. Agriculture Resources

Impact AG-1. Conversion of Prime Farmland, Unique Farmland, and Farmland of Statewide Importance to Nonagricultural Use (Significant and Unavoidable)

Finding
Pursuant to State 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 effect to less than significant as identified in the PEIR. As specified in section 15091(a)(3) of the State CEQA 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.

Rationale for Finding
Under the Order, irrigated lands operations would be required to achieve surface and groundwater quality goals, and to conduct monitoring and reporting to verify such achievement. It is anticipated many or most operations will implement new management practices to achieve these surface and groundwater quality goals. Consequently, operations under the Order will experience increased operational costs due to increased monitoring and reporting activities, as well as increased management practices, if such practices are needed to meet goals. Where such increased costs make agricultural operations unlikely or unable to continue, agriculture lands may be at risk of conversion to nonagricultural use, resulting in a significant and unavoidable impact to prime and/or unique farmland, as well as farmland of statewide importance.

As described in Attachment A of the Order under “California Water Code Sections 13141 and 13241,” the Order is based mainly on components of Alternatives 2-5 of the PEIR. It follows that, because the costs of the Order are similar to the costs of Alternative 4, economic impacts of the Order, including those causing potential loss of Important Farmland, may be estimated using the analysis of Alternative 4.

The Order’s coverage area includes the Sacramento River Basin as described in the Existing Conditions Report,[2] excluding land under rice production, plus additional acreage within the Cosumnes River Watershed which is within the San Joaquin River Basin. The PEIR describes that, under Alternative 1, described as full implementation of the previous conditional waiver program, 118,440 acres of Important Farmland within the Order area in the Sacramento River Basin potentially would be removed from production. The ratio of irrigated acreage within the

[2] California Regional Water Quality Control Board, Central Valley Region, and Jones and Stokes. 2008. *Irrigated Lands Regulatory Program Existing Conditions Report.*

Cosumnes River Watershed (est. 77,432 acres, pg 3-56, Existing Conditions Report) to the San Joaquin River Basin (est. 2,126,028 acres, Table 3-3, Economics Report),[3] is used to estimate potential additional loss within the Cosumnes River Watershed using the total potential loss of important farmland within the San Joaquin River Basin (see Table 5.10-2, PEIR): est. 5,171 acres. Using the approach described above, it is estimated that under Alternative 4 an additional 584 acres of Important Farmland within the Sacramento River Basin and Cosumnes River Watershed potentially would be removed from production because of the increased costs (total of 124,196 acres under the Order). It is unlikely that all of this acreage would be converted to a nonagricultural use, but it is reasonable to assume that some unknown quantity would be impacted.

Because implementation of the Order potentially would result in conversion of Prime Farmland, Unique Farmland, and Farmland of Statewide Importance to nonagricultural use, this impact is considered significant. **Mitigation Measure AG-MM-1: Assist the Agricultural Community in Identifying Sources of Financial Assistance that would Allow Growers to Keep Important Farmland in Production** has been incorporated into the Order to reduce the magnitude of the impact, but no feasible mitigation measures have been identified that would reduce this impact to a less-than-significant level. Mitigation measures are described in the *Mitigation Measures* section II.D.6.

7. 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 effect as identified in the PEIR.

Rationale for Finding
Use of ground-disturbing management practices under the Long-term ILRP alternatives could result in cumulatively considerable effects 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. The mitigation measure calls for identification of cultural resources and minimization of impacts to identified resources. Mitigation measures are described in the *Mitigation Measures* section.

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 effect 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

[3] ICF International 2010.

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.

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 GHGs (as shown in Table 5.6-1 of 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 of 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 by 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 the *Mitigation Measures* section.

Cumulative Vegetation and Wildlife Impacts (Significant and Unavoidable)

Finding
Pursuant to State 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 effect to less than significant as identified in the PEIR. As specified in section 15091(a)(3) of the State CEQA 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.

Rationale for Finding
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 species. **Mitigation Measures BIO-MM-1: Avoid and Minimize Impacts on Sensitive Biological Resources** and **BIO-MM-2: Determine Extent of Wetland Loss and Compensate for Permanent Loss of Wetlands** have been incorporated into the Order to reduce the severity

of these effects. The measures are sufficient to mitigate any program-related impacts to rare or endangered plant or wildlife species, and to habitat for these species; however, the cumulative impact of the reduction in quality habitat and the take of individual listed plants or wildlife species is potentially cumulatively considerable. Mitigation measures are described in the *Mitigation Measures* section.

Cumulative Fish 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 effect as identified in the PEIR.

Rationale for Finding
The ongoing impacts of impaired water quality from irrigated lands are likely to cumulatively affect fish, in combination with contaminants that remain in the Order's coverage area from past activities. Such activities include mining and past use of pesticides such as DDT that remain within sediments. Because many of the existing effects discussed in the section "Existing Effects of Impaired Water Quality on Fish" are cumulative, it is difficult to determine the relative contribution of irrigated 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 impacts of inputs from irrigated lands.

Given the U.S. Environmental Protection Agency's (EPA'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 River Watershed. Revision of water quality control plans and total maximum daily loads (TMDLs) also can be expected to improve water quality. These and other measures, in combination with the likely beneficial effects of the Order, suggest that the cumulative effects of the Order are not cumulatively considerable with implementation of mitigation measures. **Mitigation Measures FISH-MM-1: Avoid and Minimize Impacts to Fish and Fish Habitat** and **FISH-MM-2: Educate Growers on the Use of Polyacrylamides (PAMs) for Sediment Control** have been incorporated into the Order to reduce these impacts to a less than cumulatively considerable level. Mitigation measures are described in the *Mitigation Measures* section.

Cumulative Agriculture Resources 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 effect to less than significant as identified in the PEIR. 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.

Rationale for Finding
Since 1984, the average biennial net conversion of prime and unique farmland, and farmlands of statewide importance in California has been 28,344 acres (California Department of Conservation, Division of Land Resource Protection 2008). However, conversion has increased

substantially since 2000, with an average biennial net conversion of 114,003 acres (California Department of Conservation, Division of Land Resource Protection 2008). During the 2002–2004 period, prime farmland, unique farmland, and farmland of statewide importance was reduced by 133,024 acres (California Department of Conservation, Division of Land Resource Protection 2006). The trend continued during the 2004–2006 period, with a net reduction of 125,495 acres (California Department of Conservation, Division of Land Resource Protection 2008).

While conversion of important farmland may not continue at the accelerated rate of the past 10 years due to decreased demand for new housing, it is reasonably foreseeable that it will continue at a rate comparable to that seen since 1984. Given the magnitude of important farmland conversion expected from implementation of the Order, the Order could result in cumulatively considerable impacts to agriculture resources. **Mitigation Measure AG-MM-1** has been incorporated into the Order to reduce the severity of these effects. While implementation of AG-MM-1 could reduce these impacts to a level that is not a cumulatively considerable contribution to this statewide impact, such a reduction cannot be quantified. As such, the Order's contribution to this impact is potentially cumulatively considerable. No feasible mitigation measures have been identified that would reduce this impact to a less-than-significant level. Mitigation measures are described in the *Mitigation Measures* section.

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 Members choose the least impactful 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 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 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.
- Where adverse effects 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 land owner 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, Members 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 irrigated lands would minimize effects 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, Members 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 detention basins are to be abandoned, retain the basin in its existing condition or ensure that sensitive biological resources are not present before modification.
- 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 effects 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.

Mitigation Measure BIO-MM-2: Determine Extent of Wetland Loss and Compensate for Permanent Loss of Wetlands

Prior to implementing any management practice that will result in the permanent loss of wetlands, conduct a delineation of affected wetland areas to determine the acreage of loss in accordance with current U.S. Army Corps of Engineers (USACE) methods. For compliance with the federal Clean Water Act section 404 permit and WDRs protecting State waters from unauthorized fill, compensate for the permanent loss (fill) of wetlands and ensure no net loss of habitat functions and values. Compensation ratios will be determined through coordination with the Central Valley Water Board and USACE as part of the permitting process. Such process will include additional compliance with CEQA, to the extent that a further discretionary approval by the board would require additional CEQA review. Compensation may be a combination of mitigation bank credits and restoration/creation of habitat, as described below:

- Purchase credits for the affected wetland type (e.g., perennial marsh, seasonal wetland) at a locally approved mitigation bank and provide written evidence to the resource and regulatory agencies, as needed, that compensation has been established through the purchase of mitigation credits.

- Develop and ensure implementation of a wetland restoration plan that involves creating or enhancing the affected wetland type.

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), Members 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. 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 effects 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.

Mitigation Measure FISH-MM-2: Educate Growers on the Use of Polyacrylamides (PAMs) for Sediment Control

The third-party will provide information to Members on the potential risks to aquatic life, including special-status fish, that may result from the use of cationic or neutral PAMs during water management activities. Information in the form of leaflets or website information will be provided to Members, encouraging the use of anionic PAMs. Application of anionic PAMs at prescribed rates will be emphasized in the information provided to Members. Adoption of the United States Department of Agriculture National Conservation Practice Standard 450 also will be recommended in the information.

6. Agriculture Resources

Mitigation Measure AG-MM-1: Assist the Agricultural Community in Identifying Sources of Financial Assistance that would Allow Growers to Keep Important Farmland in Production

The third-party will assist the agricultural community in identifying sources of financial assistance from existing federal, state, or local programs that promote water conservation and

water quality through increased management practices. Funding received from grants, cost-sharing, or low-interest loans would offset some of the local Members expenditures for compliance with and implementation of the Order, and likely would reduce the estimated losses in irrigated acreage. Potential funding sources for this mitigation measure are discussed below. The programs described below are illustrative and are not intended to constitute a comprehensive list of funding sources.

Federal Farm Bill
The 2014 Farm Bill (the Agriculture Act of 2014, in effect through 30 September 2018) authorizes funding for conservation programs such as the Environmental Quality Incentives Program (EQIP) and the Conservation Stewardship Program. Both of these programs provide financial and technical assistance for activities that improve water quality on agricultural lands.

State Water Resources Control Board
The Division of Financial Assistance administers water quality improvement programs for the State Water Resources Control Board (State Water Board). The programs provide grant and loan funding to reduce non-point-source pollution discharge to surface waters.

The Division of Financial Assistance currently administers two programs that improve water quality associated with agriculture—the Agricultural Drainage Management Loan Program and the Agricultural Drainage Loan Program. Both of these programs were implemented to address the management of agricultural drainage into surface water. The Agricultural Water Quality Grant Program provides funding to reduce or eliminate the discharge of non-point-source pollution from agricultural lands into surface water and groundwater. It is currently funded through bonds authorized by Proposition 84.

The State Water Board's Clean Water State Revolving Fund also has funding authorized through Proposition 84. It provides loan funds to a wide variety of point-source and non-point-source water quality control activities.

Potential Funding Provided by the Safe, Clean, and Reliable Drinking Water Supply Act
This act was placed on the ballot by the Legislature as SBX 7-2 and was originally scheduled for voter approval in November 2010. In August of 2010, the Legislature removed this issue from the 2010 ballot with the intent to re-introduce it in November of 2012. In July 2012, the Legislature approved a bill to take the measure off the 2012 ballot and put it on the 2014 ballot. If approved by the public, the new water bond would provide grant and loan funding for a wide range of water-related activities, including improving agricultural water quality, conservation and watershed protection, and groundwater protection and water quality. The majority of public funds allocated by the bond would go through a rigorous competitive process to ensure dollars would go to a public benefit. Additionally, this water bond is expected to leverage more than $30 billion in additional investments in local, regional, and state wide infrastructure for water supply, water quality, and environmental restoration enhancements. The actual amount and timing of funding availability will depend on its passage, on the issuance of bonds and the release of funds, and on the kinds of programs and projects proposed and approved for funding.

Other Funding Programs
Other state and federal funding programs have been available in recent years to address agricultural water quality improvements. Integrated Regional Water Management grants were authorized and funded by Proposition 50 and now by Proposition 84. These are administered jointly by the State Water Board and the California Department of Water Resources. Proposals can include agricultural water quality improvement projects. The Bureau of Reclamation also

can provide assistance and cost-sharing for water conservation projects that help reduce discharges.

7. Cumulative Impacts

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 (please 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 Members.

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.
- 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.

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.[4] In Volume II: Appendix A of the PEIR, on 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 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 irrigated lands in the Sacramento River Watershed. 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

[4] 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.

based on continuing watershed 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 watershed-based 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 irrigated agricultural operations in the Sacramento River Watershed instead of the Order because it would not substantially reduce or eliminate any of the significant adverse effects 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 Sacramento River Watershed.

<u>Alternative 2: Third-Party Lead Entity</u>

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 irrigated agricultural operations in the Sacramento River Watershed instead of the Order because it would not substantially reduce or eliminate any of the significant adverse effects 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 2 would be consistent with most of the Programs 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 Sacramento River Watershed.

Alternative 3: Individual Farm Water Quality Management 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 discharged 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 wholly on Alternative 3 is not being pursued to regulate irrigated agricultural operations in the Sacramento River Watershed instead of the Order because it would not substantially reduce or eliminate any of the significant adverse effects 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, CV-SALTS and WDRs for dairies; and 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 program, U.S. Geological Survey, and local groundwater programs [Senate Bill (SB) 1938, 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 the Sacramento River Watershed.

<u>Alternative 4: Direct Oversight with Regional Monitoring</u>

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 irrigated agricultural operations in the Sacramento River Watershed instead of the Order because it would not substantially reduce or eliminate any of the significant adverse effects 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 the Sacramento River Watershed.

<u>Alternative 5: Direct Oversight with Farm Monitoring</u>

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 wholly on Alternative 5 is not being pursued to regulate irrigated agricultural operations in the Sacramento River Watershed instead of the Order because it would not substantially reduce or eliminate any of the significant adverse effects 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 promote coordination with other agriculture-related regulatory and non-regulatory programs of the DPR, the California Department of Public Health, 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 thousands of acres of irrigated agricultural land throughout the Central Valley.

Using the results from the Economics Report (Table 2-22) for the Sacramento River basin and the San Joaquin River basin, the projected cost of Alternative 5 is an average of $192.77 per acre per year, with a projected $53.41 per acre annual cost for monitoring and $8.73 per acre

for administration (primarily board staff costs). The estimated average cost of this Order is $105.65 per acre annually with an estimated average annual cost of $4.91 per acre for monitoring. For the approximately 1,777,000 acres in the Order area, the additional $87.13 per acre average annual cost for an individual monitoring/direct regulatory oversight approach would increase costs for the whole watershed by approximately $155 million per year.

The costs associated with Alternative 5 would result in a projected loss of 212,000[5] acres of irrigated lands, as compared to the estimated loss associated with this Order of approximately 124,000 acres (see Attachment D, page 16-17).

The additional costs and potential additional loss of Important Farmland associated with direct, individual regulation can be avoided should growers be able to successfully protect water quality under the proposed third-party administered Order.

Since the impacts to agricultural resources are substantially less with the Order than an order similar to Alternative 5, the Order is considered superior to Alternative 5 for implementation in the Sacramento River Watershed.

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 ground 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 ground 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.

[5] The potential loss of agricultural land for Alternative 5 is calculated from Table 5.10-6, Volume I of the draft PEIR based on the ratio of irrigated lands covered by the tentative Order to the total irrigated lands in the Sacramento River Basin and the San Joaquin River Basin (this is the same methodology as described in Attachment D, pages 16 and 17 for calculating potential loss of Important Farmland under the tentative Order).

Alternative 6 would establish a time schedule for compliance for addressing surface 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 irrigated agricultural operations in the Sacramento River Watershed instead of the Order because it would not substantially reduce or eliminate any of the significant adverse effects of the Order (listed in the 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 the Sacramento River Watershed.

III. Statement of Overriding Considerations Supporting Approval of the Waste Discharge Requirements General Order for Growers Within the Sacramento River Watershed that are Members of a Third-Party Group

Pursuant to the requirements of CEQA (PRC sections 21002, 21002.1, 21081) and 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 significant effects which are not avoided or substantially lessened, as described in the above findings. These significant effects include:

- Conversion of Prime Farmland, Unique Farmland, and Farmland of Statewide Importance to nonagricultural use.
- Cumulative climate change.
- Cumulative vegetation and wildlife impacts.
- Cumulative conversion of Prime Farmland, Unique Farmland, and Farmland of Statewide Importance to nonagricultural use.

Pursuant to PRC section 21081(b), specific overriding economic, legal, social, technological, or other benefits outweigh the unavoidable adverse environmental effects. The specific reasons to support this approval, given the potential for significant unavoidable adverse impacts, are based on the following.

Economic Benefits
The water quality improvements expected to occur in both surface and groundwater throughout the Sacramento River Watershed as a result of implementing the Order are expected to create broad economic benefits for residents of the Order area. 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 Sacramento River Watershed. Pages 5-3–5-5 of the Draft Technical Memorandum Concerning the Economic Analysis of the Irrigated Lands Regulatory Program (ICF International 2010) identify the potential costs of upgrading wells or treating well water that is affected by nitrate contamination. The nitrate contamination is believed to be coming from a variety of sources, including fertilizers used on agricultural lands.

Consistency with NPS Policy and State Water Board Resolution 68-16 (Antidegradation Policy)

Waste discharges from irrigated agricultural operations have 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. State policy and law require 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 irrigated agriculture 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 R5-2014-0030-06.

IV. References Cited

California Department of Conservation, Division of Land Resource Protection. 2006. 2002–2004 Farmland Conversion Report. Farmland Mapping and Monitoring Program.

California Department of Conservation, Division of Land Resource Protection. 2008. 2004 – 2006 Farmland Conversion Report. Farmland Mapping and Monitoring Program.

California Department of Justice. 2008. The California Environmental Quality Act: Addressing Global Warming Impacts at the Local Agency Level. Last revised: December 9, 2008. Available: <http://www.ag.ca.gov/globalwarming/pdf/GW_mitigation_measures.pdf>. Accessed: September 25, 2009.

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

Central Valley Regional Water Quality Control Board. 2011. *Recommended Irrigated Lands Regulatory Program Framework Staff Report*. March. Rancho Cordova, CA. Available: http://www.waterboards.ca.gov/centralvalley/water_issues/irrigated_lands/new_waste_discharge_requirements/stakeholder_advisory_workgroup/recom_ilrp_framework/recomnd_framewk_mar2011.pdf.

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.

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. Available: http://www.waterboards.ca.gov/centralvalley/water_issues/irrigated_lands/new_waste_discharge_requirements/program_environmental_impact_report/2010jul_draft_peir/econ_tech_rpt_draft.pdf.

Mason, L.B., C. Amrhein, C. C. Goodson, M. R. Matsumoto, and M. A. Anderson. 2005. Reducing Sediment and Phosphorus in Tributary Waters with Alum and Polyacrylamide. *Journal of Environmental Quality* 34: 1998–2004.

Sojka, R.E., R.D. Lentz, I. Shainberg, T.J. Trout, C.W. Ross, C.W. Robbins, J.A. Entry, J.K. Aase, D.L. Bjorneberg, W.J. Orts, D.T. Westermann, D.W. Morishita, M.E. Watwood, T.L. Spofford, and F.W. Barvenik. 2000. Irrigating with polyacrylamide (PAM): *Nine years and a million acres of experience*. P. 161-169 in R.G. Evans, B.L. Benham, and T.P. Trooien (eds.). Proceedings of the National Irrigation Symposium, 4th Decennial Symposium, Phoenix, Arizona, 14-16 November 2000. Publication 701P0004. St Joseph, MI: American Society of Agricultural Engineers.

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
CENTRAL VALLEY REGION

ATTACHMENT E TO ORDER R5-2014-0030-06
DEFINITIONS, ACRONYMS & ABBREVIATIONS

WASTE DISHARGE REQUIREMENTS GENERAL ORDER
FOR
GROWERS WITHIN THE SACRAMENTO RIVER WATERSHED
THAT ARE MEMBERS OF A THIRD-PARTY GROUP

The following definitions, acronyms and abbreviations apply to this 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. Anonymous Member ID – A unique, anonymous identifier permanently assigned to each Member.
2. Anonymous APN ID – A unique, anonymous identifier permanently assigned to each Assessor's Parcel Number (APN) that is partially or completely overlaid by irrigated lands in the region.
3. Antidegradation Policy – 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 Plans. 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.

4. Aquifer – A geologic formation, group of formations, or portion of a formation capable of yielding usable quantities of groundwater to wells or springs (40 CFR Part 257.3-4).

5. Back flow prevention devices – 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]

6. Basin Plan – Central Valley Regional Water Quality Control Plan for the Sacramento River and San Joaquin River Basins. 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.

[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.

7. Bay-Delta Plan – The State Water Resources Control Board Water Quality Control Plan for the San Francisco Bay/Sacramento-San Joaquin Delta Estuary. This plan provides protection for the Estuary's beneficial uses that require control of salinity (caused by saltwater intrusion, municipal discharges, and agricultural drainage) and water project operations (flows and diversions).

8. Certified Nitrogen Management Specialist – Certified nitrogen management plan specialists include Professional Soil Scientists, Professional Agronomists, Certified Crop Advisers[2] certified by the American Society of Agronomy, or Technical Service Providers certified in nutrient management in California by the Natural Resources Conservation Service (NRCS), or other specialist approved by the Executive Officer.

9. Degradation – Any measurable adverse change in water quality.

10. Durov Diagrams – 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.

11. 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 objective 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 USEPA, or as part of the water quality criteria being used to 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.

12. Farming Operation – A distinct farming business, organized as a sole proprietorship, partnership, corporation, limited liability company, cooperative, or other business entity that owns or operates irrigated lands.

13. Farm Operator – The person or entity, including, but not limited to a farm/ranch manager, lessee or sub-lessee, responsible for or otherwise directing farming operations in decisions that may result in a discharge of waste to surface water or groundwater. If a person or entity rents land to others or has land worked on shares by others, the person or entity is considered the operator only of the land which is retained for their own operation.

14. Fertigation – The process of applying fertilizer through an irrigation system by injecting the fertilizer into the irrigation water.

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[2] "Certified crop adviser" (CCA) means any person who is (1) recognized as a CCA by the American Society of Agronomy and is in compliance with its education requirements, and (2) issued a Nitrogen Management Certificate by the California Department of Food and Agriculture's Fertilizer Research and Education Program (FREP), and is in compliance with its continuing education requirements.

15. Groundwater – Water in the ground that is in the zone of saturation. The upper surface of the saturate zone is called the water table.

16. 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.H of the Order): (1) there is a confirmed exceedance[3] (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.

17. 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.H 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.

18. 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).

19. Hydraulic gradient – The change in total hydraulic head per unit distance in a given direction yielding a maximum rate of decrease in hydraulic head.

20. 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).

21. 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.

22. Irrigated lands – Land irrigated to produce crops or pasture for commercial purposes,[4] nurseries, and privately and publicly managed wetlands.

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[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.

[4] For the purposes of this Order, commercial irrigated lands are irrigated lands that have one or more of the following characteristics:

23. Irrigation return flow/runoff – Surface and subsurface water which leaves the field following application of irrigation water.

24. 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.

25. Low vulnerability area (surface water and groundwater) – are all areas not designated as high vulnerability for either surface water or groundwater.

26. 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 pollutant sources at levels protective of water quality.

27. Member – Owners and operators of irrigated lands within the Sacramento River Watershed that are members of a third-party group implementing this Order.

28. 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 each Member's compliance with the requirements of the Order.

29. Nitrogen Applied – Nitrogen Applied includes all nitrogen proactively added to a field from any source, such as organic amendments, synthetic fertilizer, manure, and irrigation water.

30. Nitrogen Removed – Nitrogen Removed includes all nitrogen taken from the field in harvested or other materials. Other materials may include wheat straw, orchard prunings, almond hulls, etc. In the case of perennial crops, Nitrogen Removed also includes the nitrogen annually sequestered in the permanent wood.

31. 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

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- 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*.

are sources of water pollution that do not meet the definition of a point source as defined by the CWA.

32. 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."

33. 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.

34. 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.

35. 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.

36. Perched groundwater – Groundwater separated from an underlying body of groundwater by an unsaturated zone.

37. 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.

38. 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*."

39. Qualified scientist – A person who has earned a professional degree in a scientific discipline that relates to engineering, environmental science, or chemistry with additional experience

[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

related to pesticides and water quality. This person should be familiar with the related local, state, and federal regulations.

40. Receiving waters – Surface water or groundwater that receives or has the potential to receive discharges of waste from irrigated lands.

41. 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.

42. Small Farming Operation – Refers to Farming Operations that operate less than 60 total acres of irrigated land within the Sacramento River Watershed. A parcel is not part of a Small Farming Operation if the total acres of irrigated land within the Sacramento River Watershed managed by the Farming Operation and any of its Subsidiary or Affiliated Operations is 60 acres or greater.

43. 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.

44. Stormwater runoff – The runoff of precipitation from irrigated lands.

45. Subsidiary or Affiliated Operation – a Subsidiary or Affiliated Operation of a specified Farming Operation means a Farming Operation of which the principal(s) of the specified Farming Operation or the shares possessed by the specified Farming Operation have a controlling interest. A controlling interest is having 50 percent or more of the voting or management authority of the operation.

46. Subsurface drainage – Water generated by installing and operating drainage systems to lower the water table below irrigated lands. Subsurface drainage systems, deep open drainage ditches, or drainage wells can generate this drainage.

47. Surface water – Water pooled or collected at or above ground level. Surface waters include, but are 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 this Order, surface waters do not include water in agricultural fields.

48. Tailwater – The runoff of irrigation water from an irrigated field.

49. 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. …*".

50. Toxicity – Refers to the toxic effect to aquatic organisms from waste contained in an ambient water quality sample.

51. 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.

52. Vadose Zone – See unsaturated zone.

53. 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 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.

54. 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, percolation of wastes through the soil to groundwater, or seepage of wastes through soil to surface water. 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”.

55. 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*.”

56. 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.

57. 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.

58. Water quality problem – Exceedance of an applicable water quality objective or a trend of degradation that may threaten applicable Basin Plan beneficial uses.

59. 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 antidegradation 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

2014 Farm Bill	Agriculture Act of 2014
Basin Plans	*Water Quality Control Plan for the Sacramento and San Joaquin River Basins* (4th Ed.) and *Water Quality Control Plan for the Tulare Lake Basin*
BPAW	Basin Plan Amendment Workplan
BPTC	best practicable treatment or control
CAC	county agricultural commissioner
CCA	Certified Crop Adviser
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
CHRIS	California Historical Resources Information System
COC	constituent of concern
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 and Assessment
GAR	Groundwater Quality Assessment Report
GeoTracker ESI	GeoTracker Electronic Submittal of Information Online System
GHG	greenhouse gases
GIS	Geographic Information System
GMAW	Groundwater Monitoring Advisory Workgroup
GPS	Global Positioning System
GQMP	groundwater quality management plan
GWPA	Groundwater Protection Area
HAPs	hazardous air pollutants

ILRP	Irrigated Lands Regulatory Program
MCL	maximum contaminant level
MDL	method detection limit
MMRP	mitigation monitoring and reporting program
MPEP	Management Practice Evaluation Program
MPER	Management Practices Evaluation Report
MRP	monitoring and reporting program
MRPP	monitoring and reporting program plan
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
NOA	notice of applicability
NOC	notice of certification
NOI	notice of intent
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 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
SAMR	Semi-Annual Monitoring Report
SB	Senate Bill
SIP	*Policy for Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays, and Estuaries of CA* (State Implementation Plan)
SQMP	surface water quality management plan
State Water Board	State Water Resources Control Board
SVWQC	Sacramento Valley Water Quality Coalition
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
WDRs	waste discharge requirements