LEADERSHIP COUNSEL FOR JUSTICE & ACCOUNTABILITY

COMMUNITY WATER CENTER
EL CENTRO COMUNITARIO POR EL AGUA

5 years

CLEAN WATER ACTION
CALIFORNIA

June 1, 2016

Chair Felicia Marcus and Board Members
c/o Jeanine Townsend, Clerk to the Board
State Water Resources Control Board
1001 I Street, 24th Floor
Sacramento, CA 95814
Sent via electronic mail to: commentletters@waterboards.ca.gov

RE: Comments to A-2239(a)-(c)

Dear Chair Marcus and Board Members:

On behalf of the Asociación de Gente Unida por el Agua, Fairmead Community and Friends, and Planada en Acción, we submit these comments on both the policy direction expressed in the Proposed Order and the proposed revisions to Central Valley Regional Water Quality Control Board Order No. R5-2012-0116 R-4 (Eastern San Joaquin Agricultural General WDRs, or General WDRs).

We thank the State Water Resources Control Board (State Board) for the opportunity to respond to the Proposed Order and proposed revisions, and accordingly, submit our comments in an effort to convey our support for components of the Proposed Order that bring the General WDRs closer to conformity with state standards and identify areas where the Proposed Order still fails to comply with State Law and still fails to protect California's most vulnerable communities from contamination of their drinking water.

While the Proposed Order makes significant strides toward conforming the General WDRs with basic data transparency standards across the state, it does not require performance standards that are linked to achieving water quality objectives, nor does it place strong requirements on the provision of replacement water and mitigation of nitrate impacts for residents denied clean drinking water due to agricultural discharges, thus preventing communities from realizing the Human Right to Water (Water Code 106.3). Accordingly, the Proposed Order does not remedy the deficiencies of the East San Joaquin Agricultural Waste Discharge Requirements with respect to either the Porter-Cologne Water Quality Control Act or the state Antidegradation Policy, nor does it address our clients concerns that the Order, in allowing pollution, nuisance and degradation has disproportionate and negative impact on communities of color.

As the State Board well understands, as agricultural discharges impair drinking water sources, an increasing number of Californians find themselves without clean drinking water, and the time and costs associated with cleaning up agricultural discharges grows. We remain concerned that the Proposed Order still allows, even facilitates, unchecked degradation and pollution in contravention of the very purpose of state water quality goals and in contravention of the human right to water.

Included in our comment letter submission is a summary of Community Water Center's well testing program at the bequest of the Board at the May 17th ILRP hearing in Fresno. We have also included redline edits to the Revised Order and select attachments. Please not that these redline edits are provided for the sole purpose of continuing our efforts to engage in a collaborative and amicable process to address concerns that remain in the Proposed Order. Redline edits should not be interpreted to represent our final analysis of whether or not language complies with law nor should omissions of redline edits indicate our approval of applicable sections of the Order or attachments.

Attached to this correspondence we have included edits to certain sections of the Order and attachments thereto. These edits should not be understood as our final suggested language on the Order, nor should omission of edits be understood as our acceptance of the Order as written. Rather, these suggested edits are designed to reflect our thinking at the time of the correspondence and our ongoing efforts to assist the Regional Board in adopting an Order that complies with the law.

Also attached to this correspondence, at the bequest of the Board at the Fresno ILRP hearing on May 17th, is a short summary plus results from Community Water Center's private well testing program.

The Proposed Order Violates the Porter-Cologne Water Quality Control Act

The Proposed Order fails to amend the Eastern San Joaquin Agricultural General WDRs so that they comply with the Porter-Cologne Water Quality Control Act (Porter-Cologne). The Porter-Cologne Act prohibits pollution and nuisance with respect to groundwater. (See Wat. Code §§ 13050, 13240-41, 13263(a), and 13304(a); see also Water Quality Control Plan for the Sacramento and San Joaquin River Basins (Rev. June 2015) at III-1, III-10 (Basin Plan)). Pollution is defined as "an alteration of the quality of the waters of the state by waste to a degree which unreasonably affects … [t]he waters for beneficial uses." (*Id.* § 13050(l)(1).) Nuisance is "anything … 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," and which occurs "as a result of … disposal of wastes." (Wat. Code § 13050(m).)

Waste from irrigated agriculture is the leading cause of nitrate contamination of the state's groundwater. Thomas Harter et al., *Addressing Nitrate in California's Drinking Water* (2012), University of California, Davis, Groundwater Nitrate Project, p. 17. Nitrate-contaminated water poses serious health risks, including pregnancy complications, methaemoglobinaemia (blue baby syndrome), birth defects, and cancer, as detailed extensively in our comments on the Draft Programmatic Environmental Impact Report (EIR). The wastes produced by irrigated agriculture, as the primary cause of nitrate contamination of the state's groundwater, are clearly "injurious to health" and "interfere with the comfortable enjoyment of life or property." In communities reliant on groundwater for drinking water, the contamination of groundwater caused by historic and current practices on irrigated lands clearly and unreasonably affects these communities' beneficial uses. (See Harter Report, pp. 17, 47-51.)

Under Porter-Cologne, water quality control plans are developed to establish "water quality objectives [and a] program of implementation needed for achieving water quality objectives."(Water Code § 13250(j); see

also *id.* § 13240.) Water quality objectives (WQOs) are defined as "limits ... of water quality constituents ... which are established for the reasonable protection of beneficial uses of water or the prevention of nuisance." (*Id.* § 13050(h); see also *id.* § 13241.) Waste discharge requirements, in turn, must implement water quality control plans, and thus a program to achieve water quality objectives (WQOs), protect beneficial uses and prevent nuisance. (*Id.* § 13263; see also *id.* § 13240.)

The Modified General WDRs violate Porter-Cologne because they (a) fail to provide a mechanism to ensure dischargers meet water quality objectives and (b) explicitly authorize pollution and nuisance beyond a lawful timeframe. More specifically, the Modified General WDRs fail to establish a means for determining the amount of discharges authorized by this Order, and the alterations in water quality resulting from such discharges, as well as enforceable standards that are linked to achievement of WQOs. They also unlawfully authorize pollution, nuisance, and exceedances of WQOs for 10 years or more in areas subject to Groundwater Quality Management Plans (GQMPs). Additionally, the Proposed Order allows nuisance by implying that the regional board may rely on averaging to determine the extent to which discharges achieve water quality objectives.

A. Modified WDRs Do Not Ensure Achievement of Water Quality Objectives and Prevention of Pollution and Nuisance

As stated above, waste discharge requirements must "implement ... water quality control plans," as well as "take into consideration the beneficial uses to be protected, the water quality objectives reasonably required for that purpose. . . [and] the need to prevent nuisance." (Wat. Code § 13263(a).) The WQO, or maximum contaminant level (MCL), for nitrates as nitrogen is 10 mg/L. 22 C.C.R. § 64431. Thus, under Porter-Cologne, the General WDRs must implement a regulatory program that will lead to attainment of this MCL.

In the Proposed Order, the State Water Board finds that "there is a high likelihood that the Modified [] General WDRs will lead to attainment of the receiving water limitations." However, the WDRs provide no legitimate basis for reaching this conclusion--that is, a means for determining the amount of authorized discharges that would lead to attainment of WQOs, and enforceable standards (e.g., a target A-R difference) linked to those authorized amounts. As the Court of Appeal held when analyzing a general WDRs' compliance with the Antidegradation Policy, "[t]he wish is not father to the action." (*Asociacion de Gente Unida por el Agua v. Central Valley Regional Water Quality Control Bd.* (2012) 210 Cal. App. 4th 1255, 1260-61 ("AGUA").) According to the AGUA Court, the general order finds "that the beneficial … uses of the groundwater ... will be protected by the [o]rder, but the finding wholly depends upon the [o]rder's prohibition of the further degrading of groundwater without requiring the means (monitoring wells) by which [degradation] could be determined." (*Id.*) The same reasoning applies here. The Proposed Order concludes that the Modified WDRs will achieve the receiving water limitations, without providing a mechanism for achieving receiving water limitations: i.e. enforceable standards or limits on discharges linked to attainment of WQOs. Nor do the WDRs provide enforcement mechanisms triggered by failures to adhere to such standards. In short, the Modified WDRs provide no means for ensuring that the regulatory program will lead to achievement of WQOs or protection of beneficial uses at some point in time.

While the monitoring and reporting requirements in the Modified WDRs will help improve management practices, "[a]dherence to management practices does not ensure that [water quality] standards are being met." *Monterey Coastkeeper, et al. v. California State Water Resources Control Board* (2015), No. 34-2012-80001324, at *34. In other words, "implementing management practices is no substitute for actual compliance with water quality standards." (*Id.*) Thus, even if monitoring and reporting requirements create an iterative process by which management practices improve over time (see Proposed Order at 26, 60),

without providing some type of quantifiable, enforceable standards, the Proposed Order cannot ensure that improving management practices are leading to achievement of WQOs or effectively reducing pollution or nuisance.

The Proposed Order attempts to distinguish *Monterey Coastkeeper* by arguing that the Modified WDRs are "clearer in mandating that discharges may not cause or contribute to exceedances ... except where a clearly articulated program of management practice implementation with a finite time schedule is established." (Proposed Order at 15, fn. 44.) But this begs the same questions raised above: without any data or means for linking management practices to water quality improvements, and without enforceable standards leading to achievement of WQOs, how will a "clearer" mandate or a more "clearly articulated" program of management practices do a better job of achieving water quality improvements than did the Central Coast waiver? The State Board itself acknowledges that the Proposed Order does not require the "type of data that facilitates easy determination and enforcement of compliance with receiving water limitations." (Proposed Order at 15.) But Porter-Cologne does not require compliance only if it is easy; it simply requires compliance with the WQOs. (Wat. Code § 13263(a).)

The single largest source of nitrates in the Central Valley's groundwater is, by far, irrigated agriculture. (Thomas Harter et al., *Addressing Nitrate in California's Drinking Water* (2012), University of California, Davis, Groundwater Nitrate Project, p. 17 (Harter Report)). Croplands were estimated to be contributing approximately 96 percent of all nitrates leached to groundwater in the Tulare Lake Basin and Salinas Valley, predominantly agricultural regions similar to the Eastside San Joaquin. *Id.* The Proposed Order simply fails to do the one thing that would actually lead to a reduction in nitrate loading to groundwater: require farmers to apply less nitrate. We acknowledge that the Modified WDRs contain vastly improved data collection requirements. However, as stated above, data collection will not reduce nitrate pollution until the water boards require farmers to either apply less nitrogen to the field, or remove more nitrogen from the field. Without some type of quantifiable, enforceable standards, the Proposed Order cannot ensure that the regulatory program is leading to achievement of the WQOs, or effectively reducing pollution and nuisance. To the extent the Proposed Order fails to do this, it violates Porter-Cologne.

B. Modified WDRs Explicitly Authorize Exceedance of Water Quality Objectives, Pollution, and Nuisance for an Unlawful Time Period in Areas Subject to Groundwater Quality Management Plans

The Modified General WDRs provide that "[w]astes discharged … shall not … cause or contribute to a condition of pollution or nuisance." (Modified General WDRs at 19.) However, in areas subject to GQMPs, these receiving water limitations are not effective for up to 10 years or more. (Proposed Order at 14; Modified General WDRs at 19, fn. 19.) In fact, since the trigger for requiring a GQMP includes a confirmed exceedance of a WQO "considering applicable averaging periods," and since the 10-year schedule attaches after the submission of the GQMP, the timeframe for authorized pollution and nuisance is, in effect, longer than 10 years. Thus, in areas subject to a GQMP, pollution and nuisance are explicitly authorized for up to and in excess of 10 years.

The 10-year (plus) authorization of pollution and nuisance is unlawful. Although waste discharge requirements may contain a time schedule (Wat. Cod § 13263(c)), they may not permit "unnecessary time lag." (23 C.C.R. § 2231(b).) With respect to NPDES permits, the Basin Plan authorizes compliance schedules up to 10-years long; however, this is 10 years "*from the date of adoption of the objective*." (Basin Plan at IV-16.03 (italics added).) The State of California adopted the MCL for nitrate (45 mg/L, or 10 mg/L for nitrate as nitrogen) *back in 1977*, nearly 40 years ago. The authorization of an additional 10-year delay to attain compliance with this WQO is both unnecessary and unreasonable.

As stated above, waste discharge requirements must implement a program to achieve WQOs. (Wat. Code §§ 13250(j); 13263.) WQOs, in turn, are "limits ... of water quality constituents ... which are established for the reasonable protection of beneficial uses of water or the prevention of nuisance." (*Id.* § 13050(h); see also *id.* § 13241.) Authorizing, in essence, 50 years of noncompliance with the WQO for nitrate is equivalent to authorizing 50 years of nuisance and pollution (i.e., alterations of water quality to a degree that unreasonably affects beneficial uses). Far from implementing a program to achieve WQOs, the irrigated lands regulatory program for the Central Valley has authorized unreasonable interference with beneficial uses and discharges of waste injurious to health for nearly half a century. The Modified General WDRs, to the extent that they continue to authorize pollution and nuisance, violate the Porter-Cologne Act.

In addition to being unlawful in and of itself, the authorization of 10-year compliance schedule is unlawful because the water boards do not enforce mandatory milestones, benchmarks, or interim deadlines. To comply with Porter-Cologne, the General WDRs "must include requirements reasonably designed to show measurable progress toward improving water quality over the short-term and achieving water quality standards in a meaningful timeframe." *Monterey Coastkeeper*, No. 34-2012-80001324, at *32. Per the Nonpoint Source Policy, time schedules must be specific and contain quantifiable milestones, and should include measurable, interim water quality goals. (See Policy for Implementation of the Nonpoint Source Pollution Control Program (2004), p. 13.) Since GQMPs are the primary mechanism through which the General WDRs address confirmed exceedances of WQOs, the water boards must not only require interim goals in a GQMP document, they must enforce corresponding deadlines to ensure that GQMPs are achieving their purpose. As described in the section on GQMPs below, GQMPs should contain aggressive schedules to ensure that discharges are actually on track to achieving compliance with receiving water limitations. Contrary to what the Proposed Order implies (Proposed Order at pp. 14-15, fn. 14), improved monitoring and reporting alone does not ensure that GQMPs will improve water quality in the short-term or achieve water quality standards in a meaningful timeframe.

Lastly, the authorization of 10-year schedules is unlawful because it is an inappropriate delegation of authority within the exclusive purview of the Central Valley Water Board. The regional boards may not delegate their power to modify waste discharge requirements. (See Wat. Code § 13223(a).) As stated above, GQMPs are *the* mechanism by which confirmed exceedances are addressed. So they are central to the WDRs' program of implementation to achieve water quality objectives. (See Wat. Code §§ 13250(j), 13263.) Thus, approval or modification of a GQMP is, in essence, a modification of the waste discharge requirements. However, in the Modified General WDRs, the GQMP and its schedule for compliance are developed by the coalition and approved by the Executive Officer, not by the Central Valley Board. This delegation of authority is prohibited.

In sum, the Modified General WDRs' explicit authorization of pollution and nuisance for 10-plus years violates Porter-Cologne because (1) it is an unnecessary and unreasonable schedule for complying with water quality objectives, given that the MCL for nitrate was established nearly forty years ago, (2) it does not contain enforced, quantifiable milestones and interim goals and deadlines, and (3) it constitutes an unlawful delegation of authority by the regional board. Until these issues are addressed, the time schedules will continue to violate Porter-Cologne, as well as the Nonpoint Source Policy and the Antidegradation Policy.

C. Averaging Groundwater Quality Allows for Pollution, Nuisance, and Interference with Beneficial Uses

The Proposed Order states that, "in determining compliance with [WQOs] to protect drinking water beneficial uses, the regional water board ... may rely on averaging." (Proposed Order at p. 12.) This seems to imply that the regional board may do volumetric averaging over a production zone, and conclude that the entire zone is in compliance with WQOs, even when shallow, domestic wells are known to be polluted. Such a result would clearly run counter to Porter-Cologne's mandate to protect beneficial uses. (See Wat. Code §§ 13050(h), 13050(l)(1), 13241, and 13263). If this implication was not intended, the Proposed Order should be amended to make this clear.

The Proposed Order Fails to Comply with the State Antidegradation Policy

The Proposed Order does not cure the General WDRs violations of the state's Antidegradation Policy. Antidegradation law requires that, in high-quality waters, baseline water quality must be maintained unless it is demonstrated that any change in quality will (1) be consistent with the maximum benefit to the people of the state ("maximum benefit"); (2) not unreasonably affect present or probable future beneficial uses; and (3) not result in water quality less than that prescribed by state policies. Furthermore, any activity that produces or may produce waste, and that discharges into high-quality waters, must result in best practicable treatment or control ("BPTC") to ensure that (a) pollution or nuisance will not occur, and (2) the highest water quality consistent with maximum benefit will be maintained.

The General WDRs fail to meet the requirements of Antidegradation Policy by failing to (1) establish a water-quality baseline to determine authorized alterations in water quality and their impacts on beneficial uses, (2) conduct an adequate maximum-benefit analysis, and (3) establish BPTC to ensure that nuisance and pollution will not occur and that the highest water quality consistent with maximum benefit will be maintained. In addition, as noted above, the General WDRs explicitly authorize pollution, nuisance for more than 10 years. Similarly, the general WDRs allow discharges that will result in water quality that falls short of water quality objectives.

The Court of Appeal ruled against the Central Valley Water Board regarding an earlier, similarly inadequate antidegradation analysis in *AGUA*. (210 Cal. App. 4th.) The Proposed Order attempts to distinguish *AGUA* (Proposed Order at 59, fn. 156.), but this attempt is unavailing. In a footnote, the Proposed Order implies that the case, and therefore the requirement to perform a robust antidegradation analysis, does not apply to nonpoint discharges, stating that the groundwater discharges regulated under the General WDRs are unlike the "concentrated discharges … that were the subject of [*AGUA*]." (*Id.*) This characterization of *AGUA* is inaccurate. *AGUA* addressed waste discharges from existing milk cow dairies. Waste discharges from dairies are not purely "concentrated" or point-source-like, since a major source of discharges is from fields. In other words, there is no basis for distinguishing legal precedent that applied to irrigated agricultural fields owned and operated by dairies from the irrigated agricultural fields covered by these General WDRs. *AGUA* clearly applies to these General WDRs.

The Proposed Order authorizes continued noncompliance with the Antidegradation Policy. First, the Order does not require the establishment of a water-quality baseline to determine authorized alterations in water quality. The State Water Board recognizes that the appropriate baseline is the "best quality of water since 1968," but that, "[i]n almost all cases, it will be impossible … to establish an accurate numeric baseline for potentially hundreds of waterbodies…." Thus, the Board finds that a "general review and analysis of readily available data is sufficient."

We acknowledge that a general analysis of available data is appropriate for determining whether the Antidegradation Policy applies in some circumstances. As the Proposed Order states, "the Central Valley Water Board appropriately assessed thousands of … groundwater data points and concluded that at least

some of the … groundwater in the … watershed were high quality. Based on this finding, the Central Valley Water Board acted appropriately by then conducting a general antidegradation analysis." We agree that this approach is appropriate for determining that the Antidegradation Policy applies to the Eastern San Joaquin River watershed.

Nevertheless, once determined that the Antidegradation Policy applies, it becomes unacceptable to abandon any attempt to establish a numeric baseline for the purpose of determining the level of authorized alteration to water quality and conducting a maximum benefit analysis. We concede that a calculation of the best water quality since 1968 will necessarily be an estimate based on available data. However, since any meaningful antidegradation analysis requires comparing said baseline to WQOs (*AGUA*, 210 Cal. App. 4th at 1270), it is fundamental that some baseline be established. For example, the Central Valley Salinity Alternatives for Long-Term Sustainability (CV-SALTS) process established 2-4 mg/L as the background concentration of nitrate-nitrogen in Central Valley groundwater. Without setting a baseline, the Modified General WDRs make it impossible to assess the level of degradation that will occur as a result of authorized discharges, and thus whether those changes in water quality are consistent with maximum benefit.

Second, the Proposed Order more generally sanctions an inadequate maximum-benefit analysis. It first notes that "the state depends on Central Valley agriculture for food and that Central Valley communities rely on agriculture for employment." This statement implies a false choice between agriculture and no agriculture. The Proposed Order then goes on to conclude that the "societal benefits outweigh the costs associated with the effects of irrigated agriculture under the Modified General WDRs," and thus "any degradation allowed … is consistent with the maximum benefit to the people of the state." This statement is purely conclusory, as there is no identified cost-benefit analysis supporting such a finding. In reaching this conclusion, the Proposed Order states that "if monitoring of drinking water wells indicates that MCLs are being exceeded, we expect dischargers that are causing or contributing to the exceedance to provide replacement water to the affected population." A mere "expectation," however, is not an appropriate consideration for determining the costs and benefits of discharges to the people of the state (see section on Replacement Water below).

An adequate maximum-benefit analysis must assess all of the economic, health, and environmental costs and benefits of the authorized degradation, not just the costs to the discharger. The serious health risks posed by nitrate-contaminated water increase costs not only to individuals and local agencies, but to the healthcare system as a whole. Financial costs, moreover, include not only those to farmers, but also those to individuals and communities that must spend a greater share of their incomes and resources to obtain potable water, such as through bottled water, water treatment, or the drilling of new or deeper wells; must spend increased resources on monitoring water quality; and may experience property devaluation. Contaminated water also has regional and statewide economic impacts, both because of the opportunity costs involved with diverting resources to alternative water sources, as well as because contaminated water can reduce property values throughout a town or region, increase loan costs, and in general limit community development. Without including these and other costs associated with allowed degradation, it is impossible to conclude that authorized changes in water quality are consistent with maximum benefit.

Third, the Proposed Order does not require BPTC that "ensure[s] that pollution or nuisance will not occur … and [that] the highest water quality consistent with maximum benefit will be maintained." As stated in the section on Porter-Cologne, the Modified General WDRs specifically authorize pollution and nuisance, and they provide no enforceable standards tied to water quality objectives. Moreover, the amount of authorized discharge is unknown, and the maximum benefit analysis is insufficient. Thus, it impossible to know whether authorized management practices will lead to cessation of pollution and nuisance within a reasonable timeframe.

The Central Valley Water Board must ensure that activities resulting in discharges to high-quality waters meet state standards and BPTC. *San Joaquin County Resource Conservation District, et al., v. California Regional Water Quality Control Board, Central Valley Region, et al.* (2013), No. 34-2012-80001186, at *20. For the multiple reasons given above, the Modified General WDRs do not meet this requirement.

The Proposed Order Needs to Create an Enforceable Nutrient Reporting Standard

We agree that the following nutrient ratio, as defined in the Proposed Order, is a useful metric that allows raw data to be distilled into figures that can be used to compare the nutrient efficiency of growers producing the same crop:

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

The ratio allows coalitions to prioritize their outreach and education activities and the board to prioritize operations for inspection. We think identifying standard deviation as the dividing line that triggers this oversight is appropriate. As management practices are studied and refined, we expect the nutrient budgets to have fewer outliers and reflect a lower nutrient applied:crop removed ratio.

We do not agree, however, that the nutrient ratio represents an enforceable standard that will achieve water quality objectives. While we understand that this value was recommended by the Expert Panel, these values for not appropriate for regulatory purposes because they are comparative rather than direct measurements. What is needed is an estimate of the nitrogen applied in excess of crop need that has the potential to leach to groundwater – the nitrogen loading. It is this number that must be reduced in order to meet water quality objectives. While irrigation management plays a large role in N loading, the presence of N in the soil column is the critical ingredient for N leaching. Three acres of corn planted and harvested with a nutrient ratio of 1.2 will almost certainly result in greater N loading than 10 acres of grapes with the same nutrient ratio; therefore, Board oversight of these crops should not be the same.

We appreciate the requirement to calculate A-R, which we regard as the key metric to quantify nutrient loading and identify progress towards achieving water quality objectives. However, we believe that the A-R figure should not include nitrogen in irrigation water, as that source does not contribute to loading. Our formula for $A^{external}$-R would consist of $A^{external} = (N^{synthetic\ fertilizer} + N^{organic\ amendments})$, with R retaining the same value for nitrogen removed as described in the Order. This allows an estimate of nutrient loading that can be readily calculated. We understand that this figure represents *potential* rather than actual loading to groundwater, and that figures have some degree of error; however, we believe that this number provides the opportunity to set achievable targets for growers that also links directly to achievement of the water quality objective, and that the Order requirements will, over time, reduce the current level of error that exists throughout the program.

Growers should have the option of demonstrating that their nutrient loading is below a threshold that contributes to pollution or nuisance (identified by the Harter Report as 31 pounds of excess nitrogen applied per acre per year (Harter Report, p. 17)). For growers whose nutrient loading currently exceeds the discharge limitation, interim targets can be set as needed. We believe that this addresses the fundamental problem with both the original and Proposed Order; significant levels of reporting and monitoring are required with no endpoint identified.

We attended the Nitrogen Removed Task Force meetings last summer and agree that using yield as a proxy for N removed is an appropriate metric that will provide the most accurate estimates of Nitrogen removed, pending development of more precise measurements. However, we do urge that the nitrogen removal coefficients that will be used to convert yield to $N^{removed}$ be developed and approved through a public process at the State or Regional Board. (Proposed Order at 37.) To the extent that the Proposed Order relies on these coefficients to determine the A/R ratio and A-R target, the development of the coefficients is the key to the entire program. We strongly recommend that these co-efficients be developed through a public process that engages researchers at the University of California, CDFA, and the public.

Finally, the Order should require that growers specify in the templates what mechanism was used to determine the amounts reported in the INMPs (i.e., irrigation water (e.g. flow meters), and amount of N from irrigation water (e.g. direct sampling)). We have learned from other regulatory programs that lack of equipment can mean that dischargers just estimate an amount without having an actual mechanism to measure it. It is important that reported amounts be based on realistic data, and therefore, for the data sources used be part of what is reported in INMPs.

The Proposed Order Must Strengthen Groundwater Quality Management Plans

Because the concentration of nitrates in drinking water supplies in the Central Valley is predicted to increase for some period of time, even with a robust source control program, Groundwater Quality Management Plans (GQMPs) provide an essential tool to target areas that already impact or threaten beneficial uses. We appreciate that the Board has retained the requirement to develop GQMPS; however, the Order requirements remain inadequate to ensure that water quality objectives are achieved and beneficial users of groundwater protected. These GQMPs represent those agricultural areas that are directly affecting other beneficial uses and as such should be subject to specific, aggressive and measurable requirements to reduce nutrient loading.

A. Identifying Areas Subject to Plans

We agree with the current guidance from the Central Valley Water Board that areas where nitrate concentrations in groundwater exceed 50 percent of the drinking water standard should be subject to a GQMP. This value (5 mg/l measured as N, 22.5 mg/l measured as NO_3) is a conservative standard [J2] that allows actions to be taken and the trend reversed before a health-based standard is exceeded. Moreover, the Central Valley Board's 2008 Existing Conditions Report identified a nutrient background level of just 3mg/l NO_3, so a concentration of 22.5 or higher (the level at which public water systems are required to take additional actions) is a good indication of a worsening trend in water quality. Setting GQMP requirements based on this value will allow the Regional Board to take more protective actions to protect water quality in those areas where it is most immediately threatened.

B. Necessary Plan Components

GQMPs should acknowledge that discharges have impacted beneficial uses in the areas that they cover, and accordingly include aggressive source control measures as well as full mitigation for impacted uses. Specifically, the GQMPs should include:

- Identification of all domestic and public supply wells in the area, and a plan for testing these wells for the contaminant(s) of concern in the GQMP;
- The provision of replacement water or other mitigation measures as necessary to mitigate impacts to residents (see detailed comments on this subject below)

- Increased monitoring to identify water quality trends and ensure that the boundaries of the GQMP are appropriate;

- An aggressive schedule of implementation actions with measurable goals and milestones for achieving water quality objective in the region, including:
  - Accelerated implementation of Order requirements, including:
    - Identification and safe closure of all abandoned or dry wells by a date certain. The new ability to access well drilling logs can aid in this effort;
    - Pending results from the Management Practices Effectiveness Program, the identification and implementation of practices that have been shown to limit nitrate leaching below the vadose zone.
    - Focused implementation of the Management Practices Effectiveness Program by a date certain for those crops that have the highest cumulative potential for nitrate loading to groundwater in the management area.
  - Improved and specific education and enforcement activities, including:
    - Development of a list of growers whose nutrient balance indicates improper nutrient or irrigation practices to be followed by site visits from certified nutrient practitioners;
    - Focused outreach and a hands-on, site specific education program to all growers in these areas to identify and update irrigation and fertilizer practices, with increased reporting metrics in the annual report that identify which operations have participated and whether and to what extent additional practices have been implemented and nutrient ratios improved;
    - Provide list of non-reporting growers to the Central Valley Board for enforcement within 3 months of a missed reporting deadline.
  - Targeted actions to proactively reduce nutrient loading and improve water quality, such as:
    - A schedule for implementation of a "pump and fertilize" program on a steadily increasing acreage with a goal of reducing nitrogen loading by a minimum of 10% within 5 years;
    - A target of reducing nutrient loading by at least 20% within 10 years, towards an area-wide goal of reducing nutrient loading to 31 pounds per acre or less[1];
    - Establishment of a pilot groundwater restoration program to determine the impact of affirmative efforts to improve water quality impacted by dischargers, which could include targeted recharge of high quality water upgradient of drinking water supply wells that currently exceed the MCL. This effort can be done in a coordinated fashion along the lines of the Management Practices Effectiveness Program.

The goal of GQMPs should be to achieve compliance with Water Quality objectives in a realistic timeframe. While we understand that additional data and studies are needed to improve practices and identify water quality trends, plans should be implemented with best available information and then improved as we gain greater understanding of water quality and the impact of specific practices

[1] This nutrient application figure was used to differentiate between low and high nitrate loading in *"Nitrate Contamination in the Salinas Valley and Tulare Lake Basin,* by the UC Davis Center for Watershed Science, March 2012, http://groundwaternitrate.ucdavis.edu/

The Proposed Order Must Require Mitigation of Nitrate Impacts on Beneficial Users

The proposed Order allows continued discharge of pollutants and yet does not require dischargers to mitigate the effects of nitration contamination upon nearby communities who depend on the groundwater as source of domestic water. As we have stated previously, waste from irrigated agriculture is the leading cause of nitrate contamination in the Valley (Harter Report, p. 17) and thus irrigated agriculture is responsible for mitigating the impacts nitrate contamination has on communities' beneficial uses of the contaminated water. The Order should recognize, and incorporate by reference the Human Right to Water (Water Code Section 106.3) as well as the State Water Board's recent resolution recognizing the human right to water and the Central Valley's resolution. By not requiring mitigation of impacts upon communities the Order violates the human right to water by leaving communities, rather than dischargers, to bear the cost of nitrate contamination.

Given that the proposed Order allows continued discharge of waste which will likely result in the exceedance of water quality objectives, the Order must require that dischargers mitigate their impacts to water sources used for beneficial uses. Though replacement water is mentioned in both the proposed Order and the red-line, the Order does not *require* the provision of replacement water or other mitigation requirements. Dischargers must ensure that communities impacted by nitrates and other contaminants associated with agricultural operations have access to safe, clean, and affordable drinking water in line with the Human Right to Water. This can include both interim (bottled and tanked water) and longer term solutions (treatment systems including operations and maintenance costs, new wells, etc.), depending on the extent of the contamination and the timeframe during which the contamination will persist. Furthermore, there are other costs borne by residents faced with nitrate contamination. This includes paying higher water rates to systems forced to treat water in order to provide potable water, or private well owners who have already installed a POU/POE system in their home. Dischargers must mitigate these impacts as well.

The trigger for requiring dischargers to mitigate their impacts should be attached to requirements within GQMPs. While GQMPs provide necessary monitoring and reporting requirements, these alone will not improve water quality in the near or far term. There must be a clear end goal attached to the reporting and monitoring requirements, and that goal should be to secure safe and clean water for impacted communities. As stated in the GQMP section above, plans are triggered upon testing which shows a contaminant is at 50% of the MCL, leaving time to potentially prevent an exceedance which will have negative impacts upon health. However, should the GQMP be unable to prevent further degradation of water quality mitigation of nitrate impact shall be triggered upon an exceedance of the MCL. The increased monitoring and reporting requirements of a GQMP will help protect communities from using contaminated water sooner and these plans will also show what communities may already be suffering from nitrate contamination.

As noted above, continued discharges of nitrate to groundwater violate the state's Antidegradation Policy. It is hard to see how continued discharges without a hard requirement for dischargers to mitigate the impacts of nitrates upon communities who depend on the groundwater for all their beneficial uses is in the "maximum benefit to the people of the state" nor that the discharges not "unreasonably affect present or probable future beneficial uses." (Antidegradation Policy). The health of our communities must be properly considered and this Proposed Order does not show evidence that this has occurred. Requiring mitigation fits within the requirement that the state mandate BPTC to ensure pollution will not occur and that highest quality water consistent with the maximum benefit will be maintained.

Residents directly impacted by nitrates are those whose water source (private well, water system), before any treatment system is applied, tests above the MCL. Some residents may be able to install in-home

treatment system, or their water system may have implemented a treatment program in order to deliver potable water. However, for many residents in-home treatment or water system treatment may be too expensive. Furthermore, there are homes within the Valley whose nitrate contamination is above the upper limit which treatment systems can treat the water (see Attachment A: Private Well Testing Results). This leaves communities paying for replacement water in the form of bottled, and sometimes tanked, water.

Mitigation measures must also include mitigation of contaminants which are not introduced by current agricultural operations, but which are exacerbated by agricultural operations. This includes contaminants expressed and made more hazardous due to interactions with agricultural operations and contaminants, and contaminants attributable to legacy loads that current operations move toward drinking water sources. This includes contaminants previously applied by agricultural operations which still exist in the soils such as 1,2,3-TCP, DBCP, and naturally occurring contaminants which are moved by current practices such as arsenic and uranium. These are contaminants which should be monitored under a GQMP and thus the same triggers should apply as for nitrates mitigation.

Additionally, many communities have moved drinking water wells to avoid nitrate contamination only to find arsenic or other contaminants in their new well and vice versa. Mitigation of impacts must cover treatment costs associated with cleaning up the contaminated water (whether nitrates or other contaminants in the new well) as well.

Short term mitigation of impacts solutions include tanked and bottled water to the impacted resident's home. Long-term solutions must secure a reliable source of safe and affordable water in communities and areas where contamination is likely to persist in the long term. This may include the drilling of a new well within a non-impacted area of the basin, installing new surface water or groundwater treatment systems, installing and maintaining point-of-use or point-of-entry treatment systems in communities with fewer than 200 connections that meet state requirements, or helping the community connect to a nearby water system through consolidation or service extension. The impacted communities and/or residents must be engaged in determining which option is most viable. Considerations must include consideration of the long-term viability of each option to provide safe drinking water, and cost to the consumer. Solutions which will result in a high cost of water, beyond the capacity of the residents to pay is not an acceptable solution.

Where appropriate, and other testing requirements are not already in place, such as POU solutions or re-drilling of wells serving fewer than 15 connections, there needs to be testing of the drinking water solution implemented by the discharger to ensure that the water is meeting drinking water standards.

Finally, there must be a means of enforcement to ensure that responsible parties do not shrink from their duty to provide replacement water. Affected residents should have a point of contact in case replacement water service stops unexpectedly or the residents have reason to believe the water is not of sufficient quality or quantity for domestic use.

The Proposed Order Needs Field-Level Data to Link Management Practices with Water Quality

As currently written, the General WDRs provide no means for actually determining the effect of the regulatory program on water quality. This is unacceptable and violates Porter-Cologne. To the point here, management practices data aggregated at the township level provides no means for linking practices with water quality data. As stated in the section above on Porter-Cologne, "implementing management practices is no substitute for actual compliance with water quality standards…. Adherence to management practices does not ensure that standards are being met." *Monterey Coastkeeper*, No. 34-2012-80001324, at *34. If

management practices data cannot *even be linked* to water quality data, then adherence to such practices most certainly cannot ensure that standards are being met.

The Proposed Order thus makes an important and necessary change by requiring the third-party coalition to report field-specific data, identified by location, provided by members in the Farm Evaluations and the Irrigation and Nitrogen Management Plan (INMP) Summary Reports. Field-level data will allow the water boards to link management practices with groundwater quality monitoring and nitrate-loading data. As the State Water Board makes clear, this will "allow for meaningful evaluation of management practices and their effectiveness with regard to improving water quality." (Proposed Order at 28.) In addition, it will allow the water boards to conduct more effective oversight, respond to cases of nitrogen over-application, and, if necessary, initiate enforcement actions. At a more general level, publically-accessible, field-level data would allow the state and researchers to develop improved management practices for different crops in a variety of contexts, and to assess the impact that practices are having on water quality and groundwater loading. Since, under the existing ILRP program, farmers are already providing most of the information required in the Proposed Order, it would not be difficult for the coalition to provide the data without aggregation.

We are open to discussing whether data should be crop-based or field-based for certain acreages. But at a minimum, accurate, transparent A/R data, linked to specific locations, must be provided in order to comply with Porter-Cologne and to even begin to address the problem of nitrate contamination of groundwater. The overwhelming societal benefits of these data far outweigh the costs associated with their reporting.

Some have expressed concern that the submission of field-level data in the Farm Evaluations and INMP Summary Reports would reveal trade secrets or proprietary business information. We reject this contention. A "trade secret" is information that "[d]erives independent economic value … from not being generally known to the public or to other persons who can obtain economic value from its disclosure or use." Civ. Proc. Code § 3426.1(d)(1). The data requested in the Farm Evaluation and INMP Summary Reports offer no such independent economic value, either for the farmers providing the data or for their competitors.

The current Order requires only generalized information on irrigation method, irrigation management practices, and nitrogen management practices to minimize leaching. The INMP Summary Report requires only gross information on "nitrogen applied" and "nitrogen removed" to and from the field. Neither the Farm Evaluation nor the INMP Summary Report require submission of the timing, frequency, or location of nutrient application; information about crop rotation or the location of crops within the farm; planting or harvesting schedules; source of irrigation water or how it is blended; or production costs. In other words, the reports do not require disclosure of any formula, composition, technique, or other farming-method "recipes" that could derive independent economic value. Furthermore, a competitor could not reasonably infer trade secretes merely by inspecting these reports, since the information contained therein would only be useful when combined with a number of other variables, such as weather patterns, soil conditions, and crop conditions. *See Uribe v. Howie* (1971) 19 Cal.App.3d 194, 201, 209.

Even if the broad-stroke, generalized data requested in the reports did constitute trade secrets, the public interest would weigh heavily in favor of their disclosure. (*See San Gabriel Tribune v. Superior Court* (1983) 143 Cal. App. 3d 762, 777; Gov. Code § 6254(k); Evid. Code § 1040(b).) As stated above, adequate data is a first, but necessary, step to even begin to address the immense challenge of nitrate contamination of our state's groundwater.

The Transmittal Letter for the Board's Proposed Order provides three scenarios for collecting this data. While the Board has incorporated Alternative One into the Proposed Order, with reporting beginning in 2019, we strongly urge the Board to adopt Alternative Two, which would require submission of field-level

data to begin during the first year of Order adoption. While the Proposed Order would require the coalitions and the Central Valley Board to collect and process more information than in the current permit, individual growers are already required to collect this information for retention on site/farm. Requiring early collection and analysis of these data will allow all parties to identify and address problems in data quality, collection, transmission, storage, and analysis.

In addition, we recommend that the State Water Board provide or require a means for verifying the field-level data reported to the Central Valley Water Board. The coalition is responsible for collecting and reporting the data submitted by growers in the Farm Evaluations and INMP Summary Reports. However, the Modified General WDRs do not provide a means for verifying the accuracy of these data. The State Board should require independent auditing or some other means of verification, which will allow the water boards, along with the public, to ensure accuracy. The University of California campuses and extensions are logical options for taking on the role of independent auditors.

The Proposed Order Must Require Third Parties to Conduct Adequate Outreach and Education

To successfully achieve the goals of the Irrigated Lands Regulatory Program, we need to ensure that all farmers are receiving proper outreach, education, and support to facilitate their compliance with the program. To date, the coalitions have done minimal outreach to non-English speaking farmers, as most coalitions have English-only websites, send out grower mailings that are only in English, and hold grower outreach meetings that are only in English, with rare opportunities for non-English speaking growers to receive public education or even have their questions answered. Third parties should be required to provide culturally and linguistically appropriate education and outreach for the grower populations they are serving in order to adequately fulfill the coalition's role in providing education and outreach.

Further, the coalitions should be required to implement more adequate policies for peer-to-peer learning amongst farmers. Specifically, after the third parties have compiled and collated information from each grower, the coalition should then be required to provide each grower with information about how his or her individual nutrient management and farm management practices compare to those of all other growers in their coalition, as well as to a target standard linked to water quality, such as 31 pounds N/acre/year (as used in the Harter Report, p. 17).

The Proposed Order Will Implement an Important On-Farm Domestic Well Testing Program

On-farm domestic well testing is an important aspect of the new Order. Many farmers may not be aware of contamination in their wells and domestic well testing is key to demonstrating that agricultural pollution of groundwater can affect everyone living in agricultural areas of California. Furthermore, the testing of on-farm domestic wells lends more data points to determine if exceedances are occurring, notifying the Regional Board that a review of the on-farm management practices is necessary. The Regional Board can then do a more thorough analysis of the farm's practices and bring enforcement actions against those who are not using best management practices to prevent contamination of the groundwater. The Regional Board can also use this data to require the discharger to further mitigate the impacts their application of nitrates has on local drinking water supplies.

However, we are concerned that the on-farm domestic well testing remains deficient in that it does not include testing for other agricultural-related contaminants, such as 1,2,3-TCP and DBCP, which are known groundwater contaminants that are not regulated by the Department of Pesticide Regulation because they are no longer in use. Just because these contaminants are no longer in use does not mean they no longer pollute groundwater. 1,2,3-TCP and DBCP still exist in the soils and percolates into the groundwater through recharge and application of irrigation water to contaminated soils. We propose that well testing includes

nitrates, 1,2,3-TCP, DBCP, and other contaminants in Title 22 of the California Code of Regulations (CCR), Division 4, Chapter 15, known to be related to agriculture, as determined by the Division of Drinking Water.

The Proposed Adequately Discloses Well Abandonment Data

As stated in the Proposed Order, abandoned, but not yet destroyed wells, pose a serious public health risk, and thus we support the amended Farm Evaluation Report template which now requires information on location of abandoned wells and their status as destroyed or not. The public health risk is especially a concern upon agricultural properties as there are more opportunities for contamination. Location data is important for tracking potential sources of contamination to a basin, and can used by counties or groundwater sustainability agencies in tracking and trying to halt additional contamination by requiring or helping to destroy the well. Furthermore, many counties already require destruction of abandoned wells and thus this information can provide the counties with the data necessary to track down well owners who have yet to properly destroy their wells. This requirement can further be strengthened by providing the Coalitions with the authority to require the destruction of abandoned wells in a timely manner. As stated previously in the GQMP section, the proper destruction of abandoned wells must be a requirement under a GQMP.

The Proposed Order Takes a Step Forward With Disclosure of Public Water System Well Location Data

We applaud the Board for pledging to release the location information for public water system wells. This is a logical next step following the passage of last year's SB 83. The bill amended Water Code Section 13752 and made well completion reports available to the public. This was a huge step forward in providing important data so additional studies can be conducted to further explain the health and characteristics of our state's groundwater basins. Yet, there is still one last set of data that is covered by a confidentiality agreement. This is well data for public water systems wells. Currently, public water system well location data is obscured, thus making it impossible to correlate water quality data for a particular well to potential sources of contamination.

However, cloaking this important data through confidentiality agreements has harmed many processes trying to address serious groundwater issues facing our state. So while we are excited by the big change, we will continue to advocate for the release of this data prior to the adoption of the Order so as to help researchers and contractors working on water management issues obtain all the necessary data to make informed decisions.

The Proposed Order has Disparate, Negative Impacts on Protected Classes

State law provides that no person shall, on the basis of race, national origin, ethnic group identification, and other protected classes, be unlawfully denied full and equal access to the benefits of, or be unlawfully subjected to discrimination under, any program or activity that is conducted, operated, or administered by the state. (Gov. Code § 11135). Furthermore, the state's Fair Employment and Housing Act guarantees all Californians the right to hold and enjoy housing without discrimination based on race, color, or national origin. (Gov. Code § 12900 *et seq*.)

As we stated in our petition, small, majority-Latino communities within the San Joaquin Valley are disproportionately impacted by nitrate contamination of groundwater from agricultural waste. Latinos are more likely to have higher levels of nitrates in their drinking water than the population at large. (See, for example, Carolina Balasz et al., *Social Disparities in Nitrate Contaminated Drinking Water in California's San Joaquin Valley,* Environmental Health Perspectives, 19:9 (September 2011), pp. 1272-78.) The Balazs study finds that with other variables held constant, in communities served by small water systems, increases in the percentage of Latinos were associated with increases in nitrate levels. (*Id* at 1276). For example, Balazs

studied a sample size of almost 3 million people on small water systems and found that of the 5,000 people who relied on water that exceeded the MCL for Nitrates, 50% were Latino while less than 40% of the sample size as a whole was Latino. (*Id.* at 1276.) Moreover, Latino and low-income communities are less likely to have access to adequate healthcare, water treatment, and substitute water sources, which further aggravates these disparate impacts. (*Id.* at 1273; *see also* Harter Report at 17.)

The General WDRs, by authorizing waste discharges with no requirement to mitigate nitrate impacts to drinking water sources, disparately and negatively impact communities of color, are discriminatory and, as such, violate state law. The Proposed Order finds that, with the addition of the monitoring and reporting requirements discussed above, the Modified General WDRs will not disproportionately impact or discriminate against Latinos and low-income communities. However, for the reasons discussed above, the Modified General WDRs are inadequate to protecting groundwater for communities. For one, the WDRs explicitly authorize pollution and nuisance for more than 10 years. For another, there is no requirement that the dischargers must pay for the impacts nitrate contamination has on drinking water sources, leaving the burden on those low-income residents living in nitrate-impacted communities. The negative impacts of these inadequacies will continue to disparately burden low-income, communities of color.

The Government Code renders null and void any action undertaken by a local governmental agency that denies to any individual or group of individual the enjoyment of their residence, landownership or tenancy. (Gov. Code § 65008). The State Water Board's final Order, if it fails to protect the drinking water for California's most vulnerable communities, may be null and void.

The Proposed Order Must Expand its Trend Monitoring Requirement

Trend Monitoring data must be expanded to include constituents that are not covered by DPR but which are known groundwater contaminants associated with agriculture, in particular 1,2,3-TCP and DBCP. These contaminants should be expressly highlighted as contaminants not covered by DPR, but which are constituents which should be covered by the ILRP trend monitoring. While these contaminants are no longer used, they do exist in the soils and the groundwater and thus are continually applied to crops through irrigation. Furthermore, trend monitoring of these contaminants will be useful to track how contaminant plumes are moving due to on-going agricultural practices - both pumping and application of irrigation water. These constituents are associated with past agricultural practices and are moved and continue to be applied to fields due to current agricultural practices and should thus be tracked and covered by the IRP.

The Proposed Order Fails to Incentivize Compliance or Reduce Impacts to Drinking Water Sources

It is vital that the State Board consider the role of these General WDRs within the broader nitrate control and mitigation context. Currently, under the current and proposed General WDRs, our most vulnerable communities are not protected and pay the costs for ongoing contamination. There has yet to be a single replacement water order or other enforcement actions requiring clean-up or abatement in the Central Valley. The current Order has no ability to take enforcement action for contribution to pollution or nuisance because there is not adequate data from individual dischargers, and the desire of dischargers to continue to be able to conceal data just aims to continue to leave all nitrate pollution costs on drinking water users and allow dischargers to avoid any liability to pay those costs. There are no requirements within this current or Proposed Order or any other existing mechanism for agriculture to provide replacement water or pay for the costs of the on-going pollution it has and continues to cause. There is also no enforceable mechanism to ensure on-going pollution does not continue, as there is no regulatory standard or action level linked to level of nitrogen loading or water quality. Thus, even under this Proposed Order, there is no incentive for agricultural dischargers to participate in the broader nitrogen solutions being developed under CV-Salts

because under this General WDR they are given a shield from liability as long as they have submitted a groundwater quality management plan.

This Order must ensure that dischargers are not allowed to contribute to pollution or nuisance and that there is adequate standards and data collected to enforce against those that are. Without that mechanism, no rational discharger will ever participate in the kinds of voluntary Alternative Compliance Programs being developed and discussed under CV-Salts. And the burden and costs of nitrate pollution will continue to fall entirely on drinking water users without dischargers having to pay their fair share.

Conclusion

Due to the unknown nature of how long nitrates will continue to contaminate our state's groundwater basins, we must have the mechanisms in place which ensure all communities throughout the state have access to safe, clean, and affordable drinking water which is consistent with the Human Right to Water, Porter-Cologne, and the state Anti-Degradation Policy. We value the great amount of effort that has been put into establishing the existing irrigated lands regulatory program, but without adequate data and transparency, no one - on any side - will understand what's happening and how we can improve practices to get a handle on the problem of nitrate pollution from agriculture. We can't have thriving agricultural communities without thriving agricultural economies, but in order to have a thriving agricultural economy, we need livable communities for farmworkers.

Thank you for your consideration of these comments. If you have any questions or concerns, please do not hesitate to contact us. We look forward to continuing to work with staff and the Boards to develop an effective irrigated lands regulatory program.

Sincerely,

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CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
CENTRAL VALLEY REGION

Order R5-2012-0116, Revision 4
(referred to herein as Order R5-2012-0116-R4)

WASTE DISCHARGE REQUIREMENTS GENERAL ORDER FOR GROWERS WITHIN THE EASTERN SAN JOAQUIN RIVER WATERSHED THAT ARE MEMBERS OF THE THIRD-PARTY GROUP

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CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
CENTRAL VALLEY REGION

Order R5-2012-0116-R4

WASTE DISCHARGE REQUIREMENTS GENERAL ORDER FOR GROWERS IN THE EASTERN SAN JOAQUIN RIVER WATERSHED THAT ARE MEMBERS OF THE THIRD-PARTY GROUP

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 Eastern San Joaquin River Watershed. 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 the third-party representing this area

(hereinafter “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.

3 The Eastern San Joaquin River Watershed is bounded by the crest of the Sierra Nevada Mountain Range to the east, the Stanislaus River to the north, the San Joaquin River to the west, and the San Joaquin River Basin boundary to the south as identified in the Sacramento and San Joaquin River Basin Plan. This area is referred to as the “Order watershed area” or “third-party area” in this Order. See Figure 1 for a map of the third-party area.

There are some locations within the Eastern San Joaquin 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.

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.[2]

6 This Order does not apply to discharges of waste that are regulated under other Water Board issued WDRs or conditional waiver of WDRs. If the other 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 conditional waiver of WDRs.

7 This Order implements the long-term ILRP in the Eastern San Joaquin River Watershed. The long-term ILRP has been conceived as a range of potential alternatives and evaluated in a programmatic environmental impact report (PEIR).[3] 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, together 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 Eastern San Joaquin 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 provisions of this Order require that the Member provide notification to the non-Member responsible party of enrollment under this Order. The third-party group representing Members will assist with carrying out the conditions of this Order. Both the landowner and operator are ultimately responsible for complying with the terms and conditions of this Order.

9 The third-party entity proposing to represent Members in the Order watershed area (the third-party) is required to submit to the Central Valley Water Board an application to represent growers within this Order's coverage area. The third-party representation will become effective upon Central Valley Water Board Executive Officer approval of the third party's application. The East San Joaquin Water Quality Coalition served as the third-party group representing owners and operators of irrigated lands within 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 and groundwater monitoring, regional management plan development and tracking) of this Order and associated Monitoring and Reporting Program Order R5-2012-0116-R4 (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 have different application requirements depending on the timing of its request for regulatory coverage (see section VII.A of this Order for specific requirements). Growers that enroll within 120 days of Executive Officer approval of the third-party will enroll under this Order by obtaining membership in the third-party group. This will streamline the initial enrollment process for the bulk of the irrigated agricultural operations within the Eastern San Joaquin River Watershed. Growers who do not enroll within 120 days of Executive Officer approval of the third-party, or whom are prompted to apply by Central Valley Water Board enforcement or inspection, are required to submit a Notice of Intent (NOI) to comply with the terms and conditions of this Order to the Central Valley Water Board and obtain membership with the third-party group. This

additional step for late enrollees is intended to provide incentive for growers to enroll promptly. There will be an administrative fee for submitting an NOI to the board. The fee will help recover costs for board efforts to conduct outreach to ensure growers subject to this Order enroll or submit reports of waste discharge.

Reason for the Central Valley Water Board Issuing this Order

12 The Eastern San Joaquin River Watershed region has approximately one million acres of cropland under irrigation and approximately 3,900 growers with "waste discharges from irrigated lands," as defined in Attachment E to this Order. Currently, approximately 165,000 acres are regulated under the Water Board's General Order for Existing Milk Cow Dairies (R5-2007-0035) and 538,121 acres are regulated under the Coalition Group Conditional Waiver. Approximately 3,600 growers and 835,000 associated irrigated acres will require regulatory coverage under this Order or other WDRs or conditional waivers of WDRs. Small Farming Operations are those with a total farming operation that comprises less than 60 acres of irrigated land. In counties within the Eastern San Joaquin River Watershed, Small Farming Operations are operated by approximately 61 percent of the growers, but account for approximately 6% of the total irrigated lands. Medium Farming Operations are those with a total farming operation that comprises more than 60 acres but less than 250 acres of irrigated land. In counties within the Eastern San Joaquin River Watershed, Medium Farming Operations are operated by approximately 22 percent of growers, but account for approximately 14 percent of the total irrigated lands. Large Farming Operations are those with a total farming operation that comprises more than 250 acres of irrigated land. In counties within the Eastern San Joaquin River Watershed, Large Farming Operations are operated by approximately 17 percent of growers, but account for approximately 80 percent of the total irrigated lands.[4]

13 The Eastern San Joaquin River Watershed region contains all or portions of seven groundwater sub basins and has approximately 3,000 linear miles of surface water courses (including 700 linear miles of named 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 foothill and mountainous regions of the third-party area, where there are few 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.

14 Within the third-party area, there are approximately 359,000 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) and a depth to groundwater shallower than 70 feet. Of the 359,000 acres, approximately 236,000 acres of the irrigated lands are within DPR GWPAs that are characterized as vulnerable to leaching of pesticides (leaching areas), approximately 120,000 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 2,510 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)[5] 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 25 water bodies encompassing 450 linear miles of surface water courses have been listed as impaired pursuant to Clean Water Act section 303(d)[6] within the third-party area. Approximately 15 of those water bodies identify the potential source of the impairment as agriculture, and the remaining water bodies identify an unknown source of impairment. For example, Berenda Creek, Berenda Slough, Deadman Creek, Dry Creek, Duck Slough, Harding Drain, Highline Canal, Merced River, Mustang Creek, San Joaquin River, Stanislaus River, and the Tuolumne River are listed as impaired by the pesticide chlorpyrifos. Agriculture is identified as the potential 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.[7]

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.[8] Available data (see Information Sheet and the PEIR) indicate that there are a number of wells within the Eastern San Joaquin River Watershed that have exceeded the MCL for nitrate. Groundwater in the Eastern San Joaquin Watershed has been designated for drinking water uses; therefore, the water quality objective of 10 mg/L for nitrate plus nitrite (as nitrogen) applies to groundwaters in the Eastern San Joaquin River Watershed. Where nitrate groundwater quality data are not available, information on the hyrdrogeological characteristics of the area suggest that significant portions of the Eastern San Joaquin River Watershed are vulnerable to

nitrate contamination. Sources of nitrate in groundwater 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 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 Water Code section 13260 has been filed. The WDRs must implement relevant water quality control plans and the 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 Eastern San Joaquin 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[9] 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 Water Code Division 7).

21 Water Code section 13267(b)(1) states: "(1) *In conducting an investigation specified in subdivision (a), the regional board may require that any person who has discharged, discharges, or is suspected of having discharged or discharging, or who proposes to discharge waste within its region, or any citizen or domiciliary, or political agency or entity of this state who has discharged, discharges, or is suspected of having discharged or discharging, or who proposes to discharge, waste outside of its region that could affect the quality of waters within its region shall furnish, under penalty of perjury, technical or monitoring program reports which the regional board requires. The burden, including costs, of these reports shall bear a reasonable relationship to the need for the report and the benefits to be obtained from the reports. In requiring those reports, the regional board shall provide the person with a written explanation with regard to the need for the reports, and shall identify the evidence that supports requiring that person to provide the reports. (2) When requested by the person furnishing a report, the portions of a report that might disclose trade secrets or 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 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 deadlines for reports and monitoring specified in this Order and attached MRP are based on whether an operation is a small, medium, or large farming operation. A Member who is covered under this Order must comply with MRP Order R5‑2012‑0116-R4 which is part of this Order, and future revisions thereto by the Executive Officer or board.

23 The surface water quality monitoring and trend groundwater quality monitoring under this Order are regional in nature instead of individual field discharge monitoring. The benefits of regional monitoring include the ability to determine whether water bodies accepting discharges from numerous irrigated lands are meeting water quality objectives and to determine whether practices, at the watershed level, are protective of water quality. However, there are limitations to regional monitoring's effectiveness in determining possible sources of water quality problems, the effectiveness of management practices, and individual compliance with this Order's requirements.

Therefore, 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. In addition, Members must report the practices they are implementing to protect water quality. Through the evaluations and studies conducted by the third-party, the reporting of practices 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 and evaluation does not allow the Central Valley Water Board to determine potential sources of water quality problems or identify whether management practices are effective, this Order requires the third-party to provide technical reports at the direction of the Executive Officer. Such technical reports are needed when monitoring or other available information is not sufficient to determine the effects of irrigated agricultural waste discharges to state waters. It may also be necessary for the board to conduct investigations by obtaining information directly from Members to assess individual compliance.

24 The Central Valley Water Board's *Water Quality Control Plan for the Sacramento River and San Joaquin River Basins* (hereafter Basin Plan) designates beneficial uses, establishes water quality objectives, contains programs of implementation needed to achieve water quality objectives, and references the plans and policies adopted by the State Water Board. The water quality objectives are developed to protect the beneficial uses of waters of the state. Compliance with water quality objectives will protect the beneficial uses listed in Finding 26.

25 This Order implements the Basin Plan by requiring the implementation of management practices to achieve compliance with applicable water quality objectives and requiring the prevention of 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 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 waters in the Eastern San Joaquin River Watershed may include:

a. Municipal and Domestic Supply
b. Agricultural Supply
c. Industrial Service Supply
d. Hydropower Generation
e. Water Contact Recreation
f. Non-Contact Water Recreation
g. Warm Freshwater Habitat
h. Cold Freshwater Habitat
i. Migration of Aquatic Organisms
j. Spawning, Reproduction and Development
k. Wildlife Habitat
l. Freshwater Replenishment
m. Industrial Process Supply

27 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.

28 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.

29 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 Plans, constitute enforceable water quality standards for priority toxic pollutants in California surface waters.

California Environmental Quality Act

30 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.

31 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).

32 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.

33 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.

34 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

35 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.

36 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). This Order does not authorize further degradation of such waters.

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 limited 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.

California Water Code Sections 13141 and 13241

37 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 Eastern San Joaquin River Watershed, is based on Alternatives 2-6 of the PEIR; therefore, estimated costs of this Order fall within the Basin Plan cost range.[10] The total annual cost of compliance with this Order, e.g., summation of costs for administration, monitoring, reporting, tracking, implementation of management practices, is expected to be approximately $4.10 per acre greater than the current surface water only protection program under the Coalition Group Conditional Waiver. The total estimated cost of compliance of continuation of the previous Coalition Group Conditional Waiver within the Eastern San Joaquin River Watershed is expected to be approximately 96 million dollars per year ($114.45 per acre annually). The total estimated cost of compliance with this Order is expected to be approximately 99 million dollars per year ($118.55 per acre annually).

Approximately $113.34 of the estimated $118.55 per acre 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.[11] 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 $0.56/acre. The combined total estimated costs that include third-party and state fees are estimated to be $4.50 /acre annually or less than 5% of the total estimated cost of $118.55 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. The basis for these estimates is provided in the *Draft Technical Memorandum Concerning the Economic Analysis of the Irrigated Lands Regulatory Program.****[12]*** Attachment A includes further discussion regarding the cost estimate for this Order.

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

(a) Past, present, and probable future beneficial uses of water.
(b) Environmental characteristics of the hydrographic unit under consideration, including the quality of water available thereto.
(c) Water quality conditions that could reasonably be achieved through the coordinated control of all factors which affect water quality in the area.
(d) Economic considerations.
(e) The need for developing housing within the region.
(f) The need to develop and use recycled water.

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

Relationship to Other Ongoing Water Quality Efforts

39 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.

40 The Central Valley Salinity Alternatives for Long-Term Sustainability (CV-SALTS) initiative has the goal of developing sustainable solutions to the increasing salt and nitrate concentrations that threaten the achievement of water quality objectives in Central Valley surface and groundwater. This Order requires actions that will reduce nitrate discharges and should result in practices that reduce salt loading. The board intends to coordinate all such actions with the CV-SALTS initiative. CV-SALTS may identify additional actions that need to be taken by irrigated agriculture and others to address these constituents. This Order can be amended in the future to implement any policies or requirements established by the Central Valley Water Board resulting from the CV-SALTS process. This Order includes provisions to promote coordination with CV-SALTS and to support the development of information needed for the CV-SALTS process.

41 Total Maximum Daily Loads (TMDLs) are established for surface waters that have been placed on the State Water Board's 303(d) list of Water Quality Limited Segments for failure to meet applicable water quality standards. A TMDL, which may be adopted by the Central Valley Water Board as Basin Plan amendments, is the sum of allowable loads of a single pollutant from all contributing point sources and nonpoint sources. The Central Valley Water Board is currently developing a pesticide TMDL and organochlorine pesticide TMDL, among others in development. This Order will implement these and other future TMDLs to the extent there are established requirements that pertain to irrigated agriculture, as well as the following approved TMDLs: San Joaquin River Deep Water Ship Channel dissolved oxygen; San Joaquin River salt, boron, selenium, diazinon, and chlorpyrifos.

42 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 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 coordinate their response to identified water quality problems.

43 The Central Valley Water Board approved the East San Joaquin Water Quality Coalition Management Plan on 25 November 2008. This plan includes implementation of the approved TMDLs listed in Finding 41. 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.

COORDINATION AND COOPERATION WITH OTHER AGENCIES

44 *Integrated Regional Water Management Plans:* Pursuant to part 2.75 of Division 6 of the Water Code (commencing with section 10750), local agencies are authorized to adopt and implement groundwater management plans (hereinafter "local groundwater management plans"), including integrated regional water management plans. The legislation provides recommended components to the plans such as control of saline water intrusion, regulation of the migration of contaminated water, monitoring of groundwater levels and storage, and the development of relationships with regulatory agencies. The information collected through implementation of groundwater management plans can support or supplement efforts to evaluate potential impacts of irrigated agricultural discharges on groundwater. This Order requires the third-party to develop regional 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 regional groundwater monitoring workplans and GQMPs.

45 *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.

46 *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 an irrigation and nitrogen management plan and submittal of a summary report. 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.

47 *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. [13] In its report, the State Water Board made fifteen recommendations to address the issues associated with nitrate contaminated groundwater.

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[14] 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[15] 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.

48 The Central Valley Water Board will continue to work cooperatively with the other state agencies to identify and leverage their efforts.

ENFORCEMENT FOR NONCOMPLIANCE WITH THIS ORDER

49 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 if the discharge involves a discharge of pollutants; 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. 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.

50 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).[16]
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 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 in a complete and timely fashion.
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.
K. Failure to provide appropriate mitigation for beneficial users of groundwater impacted by continued discharge.

51 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

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

53 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.

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

55 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.

56 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.

57 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 Water Code for further discharges of waste to surface or groundwater.

58 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.

59 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.

60 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.

61 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.

62 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.

63 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 Eastern San Joaquin River Watershed, and has provided them with an opportunity for a public hearing and an opportunity to submit comments.

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

65 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 the third-party group, 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 East San Joaquin Water Quality Coalition in the Eastern San Joaquin River Watershed.

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[17]

1. Wastes discharged from Member operations shall not cause or contribute to an exceedance of applicable water quality objectives in surface water, unreasonably affect applicable beneficial uses, or cause or contribute to a condition of pollution or nuisance.

B. Groundwater Limitations[18]

1. Wastes discharged from Member operations shall not cause or contribute to an exceedance of applicable water quality objectives in the underlying groundwater, unreasonably affect applicable beneficial uses, or cause or contribute to a condition of pollution or nuisance.

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 R5-2012-0116-R4. 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 and to achieve compliance with applicable water quality objectives. Where applicable, the implementation of practices must be in accordance with the time schedule contained in an approved Groundwater Quality Management Plan or Surface Water Quality Management Plan.

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)[19] 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) R5-2012-0116-R4, and future revisions thereto.

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

4. Each Member[20] shall participate in third-party outreach events, at least annually. 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.

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 in accordance with any water quality management plans approved by the Central Valley Water Board Executive Officer, and/or as necessary to protect water quality and to achieve compliance with surface 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. Members with the potential to cause erosion and discharge sediment that may degrade surface waters, as identified by the Member in their Farm Evaluation, by the third-party in the Sediment Discharge and Erosion Assessment Report, or by the Executive Officer shall prepare and implement a Sediment and Erosion Control Plan as specified in section VII.C below.

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.[21]

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 Water Code 13260.

11. This Order does not convey any property rights or exclusive privileges.

12. This Order shall not create a vested right, and all such discharges of waste shall be considered a privilege, as provided for in 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 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 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 headquarters for its farming operation. 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 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.

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.

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. Provide timely and complete submittal of any reports required by this Order.

7. Within 30 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 confirmation form to be completed by each Member.

8. Conduct education and outreach activities to inform Members of program requirements and water quality problems, including exceedances of water quality objectives or degradation of water quality, identified by the third-party or Central Valley Water Board. The third-party shall:

a. Maintain participation lists for 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 attended the outreach events and describe how growers could obtain copies of the materials presented at these events.

c. Provide additional INMP self-certification training for Members notified as having fields with an $A/R_{3\ year}$ ratio[22] greater than one standard deviation from the mean who opt not to use a specialist for INMP certification. This INMP self-certification training shall be focused on assisting Members 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 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, identify the growers 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 associated with any applicable SQMP/GQMP or other provisions of this Order; (3) failed to participate in third-party studies for which the third-party is the lead; (4) failed to provide confirmation of participation in an outreach activity (per section IV.B.4 of this Order); or (5) failed to submit required fees to the third-party.

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.

V. Effective Dates

1. This Order is effective upon adoption by the Central Valley Water Board on **7 December 2012** and remains in effect as revised by the Central Valley Water Board on **3 October 2013, 27 March 2014 and 17 April 2015**; and as revised by the State Water Board Order on **[day month year]**; unless rescinded or further revised by the Central Valley Water Board.

2. Regulatory coverage under this Order for discharges of waste from Members 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 within 120 days of Executive Officer issuance of an NOA to the third-party.

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 within 120 days of 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.

4. After the initial 120-day period following issuance of an NOA to the third-party group, regulatory coverage is effective upon notification by the Central Valley Water Board that this Order applies to the grower through the issuance of an NOA. The Central Valley Water Board shall only issue an NOA after it has received a Notice of Intent (NOI) as required by section VII.A, and after the Central Valley Water Board has received notification from the third-party that the Discharger is a Member. The Discharger must pay any applicable State Water Board administrative fees associated with the filing of NOIs.

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

1. This Order may be reopened to address any changes in state statutes, regulations, plans, or policies that would affect the water quality requirements for the discharges, including, but not limited to, the Central Valley Water Board *Water Quality Control Plan* (Basin Plan) *for the Sacramento River and San Joaquin River Basins*.

2. The filing of a request by the 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.

3. 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.

4. 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 the Order 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).

5. 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 51 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.

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

VII. Required Reports 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 R5-2012-0116-R4. 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, Members that, as of the effective date of this Order, are enrolled under Order R5-2006-0053 as Members of the East San Joaquin Water Quality Coalition must submit a completed notice of confirmation (NOC) to the third-party within 120 days of Executive Officer approval of the third-party (as provided by issuance of an NOA to the third-party, see section VIII.A of this Order). The third-party will provide a NOC form to Members within 30 days of receiving an NOA (see section VIII.A) from the Central Valley Water Board. As part of the NOC, Members 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 (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.

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 avoid additional fees and administrative requirements (see section VII.A.3 below). 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 Members of the San Joaquin County and Delta Coalition; Westside San Joaquin River Watershed Coalition; or Southern San Joaquin Valley Water Quality Coalition governed by the Coalition Group Conditional Waiver whose parcel(s) are located in the Eastern San Joaquin River Watershed.

3. Beginning 121 days after Executive Officer issuance of an NOA to the third-party, any growers within this Order's boundaries that are not yet Members of the third-party

or a Coalition governed by the Coalition Group Conditional Waiver must submit (1) a completed Notice of Intent (NOI) to the Central Valley Water Board to comply with the conditions of this Order, (2) any required State Water Board administrative processing fee for the NOI, and (3) a Membership application to the third-party group. Upon submittal of a complete NOI, and after receiving confirmation from the third-party group that the grower is now a Member, the Central Valley Water Board Executive Officer may then issue a Notice of Applicability (NOA), after which the Member will be considered covered under this Order. In lieu of issuing an NOA, the Executive Officer may deny the NOI and 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 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

All Members shall complete a Farm Evaluation and submit a copy of the completed Farm Evaluation for the previous crop year to the third-party group according to the schedule below. The Member must use the Farm Evaluation Template approved by the Executive Officer (see section VIII.C.1 below). A copy of the Farm Evaluation shall be maintained at the Member's farming 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. Members with Small Farming Operations

By 1 March 2017, Members with Small Farming Operations must prepare their Farm Evaluation for the previous crop year and submit it to the third-party. An updated Farm Evaluation must be prepared and submitted to the third-party by 1 March annually thereafter. As a part of the Farm Evaluation, the Member shall provide information on any outreach activity participation in accordance with section IV.B.4 of this order.

2. Members with Medium or Large Farming Operations[23]

By 1 March 2015, Members with Medium or Large Farming Operations must prepare their Farm Evaluation for the previous crop year and submit it to the third-party. An updated Farm Evaluation must be prepared and submitted to the third-party by 1 March annually thereafter. As a part of the Farm Evaluation, the Member shall provide information on any outreach activity participation in accordance with section IV.B.4 of this order.

C. Sediment and Erosion Control Plan

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. The Member must use the Sediment and Erosion Control Plan Template approved by the Executive Officer (see section VIII.C.3 below), or equivalent. The Sediment and Erosion Control Plan must be prepared in one of the following ways:

- 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 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

- The Sediment and Erosion Control Plan must be written, amended, and certified by a Qualified Sediment and Erosion Control Plan Developer 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; 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 Enviro Cert International, Inc.; professional in erosion and sediment control registered through the National Institute for Certification in Engineering Technologies (NICET); or

- 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.

1. Deadline for Members with Small Farming Operations

Within one (1) year of the Executive Officer accepting the third-party's Sediment Discharge and Erosion Assessment Report, Members with Small Farming Operations must complete and implement a Sediment and Erosion Control Plan.

2. ***Deadline for Members with Medium or Large Farming Operations***
Within 180 days of the Executive Officer accepting the third-party's Sediment Discharge and Erosion Assessment Report, all other Members must complete and implement a Sediment and Erosion Control Plan.

D. Irrigation and Nitrogen Management Plan, Nitrogen Applied/Removed Ratio, and Nitrogen Applied-Removed Difference

All Members must prepare and implement a certified Irrigation and Nitrogen Management Plan (INMP) for each field (and each crop grown within that field) and submit the INMP[24] Summary Report for the previous crop year, per the schedule detailed below. The Member must use the INMP Template approved by the Executive Officer (see section VIII.C.2. 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.[25] 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.

An INMP must include the information identified in Attachment B MRP Section VI.B to determine an Applied/Removed (A/R) ratio for nitrogen, and an Appliedexternal-Removed (Aex-R) difference for nitrogen, as defined in the equations below. The A/R ratio is the ratio of total Nitrogen Applied[26] (from sources including, but not limited to, organic amendments, synthetic fertilizers, manure, and irrigation water) to the total Nitrogen Removed[27] (including all harvested materials and nitrogen annually sequestered in permanent wood for perennial crops). The Aex-R difference is the difference of ~~total~~ Nitrogen Appliedfrom external sources and the total Nitrogen Removed.

A-R Difference

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 VI.B to determine, through nitrogen removed testing and research, the most appropriate C_N coefficients for converting crop yield to nitrogen removed. Once a C_N value has been established for a Member's crop, the Member will report the crop yield and the Nitrogen Removed as determined by multiplying the crop yield by C_N in the INMP for current and previous years.

Nitrogen Removed (lbs/acre) = Crop Yield (units/acre) x C_N (lbs/unit)

The INMP shall be maintained at the Member's farming operations headquarters or primary place of business. The Member must provide the INMP 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 all INMP Summary Report data to the Executive Officer.

All Members must prepare and implement a certified INMP, 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[28] 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 Specialist 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

· 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.

Members notified by the third-party as having fields with an $A/R_{3\ year}$ ratio[29] greater than one standard deviation from the mean 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 with Small Farming Operations***

By 1 March 2017, Members with Small Farming Operations shall prepare and implement an INMP. By 1 March 2018, and annually thereafter, Members with Small Farming Operations shall prepare and implement a certified INMP and submit to the third-party the INMP Summary Report for the previous year.

2. Deadlines for Members with Medium or Large Farming Operations[30]

By 1 March 2015, Members with Medium or Large Farming Operations shall prepare, and implement an INMP. By 1 March 2016, and annually thereafter Members with Medium or Large Farming Operations shall prepare and implement a certified INMP and submit to the third-party the INMP Summary Report for the previous year.

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 drinking water supply wells present on the Members' property. If a well is identified as exceeding the MCL for nitrate, the Member must notify the Central Valley Water Board. That member, or the Central Valley Water Board, must then notify users of the well in a timely fashion in accordance with the elements described in 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. Notice of Termination

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

VIII. Required Reports and Notices – 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. 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, the third-party must submit a letter to the Executive Officer requesting that the third-party serve as a third-party representing

Members to carry out the third-party responsibilities. 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 identified third-party responsibilities.
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. 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 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.

B. Membership (Participant) List

The third-party shall submit a list of its Members to the Central Valley Water Board within 180-days of receiving an NOA from the board and then annually by 31 July of each year (beginning the year following initial submission of the list). 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 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, the name of the farm operator for each parcel, if different from the Member, and identification of each parcel as part of a Small, Medium, or Large Farming Operation. 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. 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

Through the process described below, the Central Valley Water Board intends to provide templates to all Members that must be used to comply with the requirements of this Order. The

board intends that these templates be developed by the third-party or Central Valley Water Board staff in coordination with other agricultural groups and experts to ensure the templates are applicable and relevant for Members. To the extent possible, the templates need to collect information consistently across irrigated agricultural areas and commodities. Consistent information collection will facilitate analysis within a geographic area and across the Central Valley. However, the board recognizes that templates may vary (e.g., by commodity group) and may need to be tailored more specifically to ensure relevant information is collected. For example, templates for irrigated pasture would focus on collecting different types of data than templates for orchards.

1. Farm Evaluation Template

Template development shall be in accordance with the requirements specified in Attachment B MRP section VI.A. Templates will be developed as follows:

a. Central Valley Water Board Farm Evaluation Template

A Farm Evaluation Template meeting the requirements of Attachment B MRP section VI.A is provided for use in Attachment B MRP, Appendix MRP-3, or

b. Third-Party Farm Evaluation Template

The third-party may work with Central Valley Water Board staff in the development of a Farm Evaluation Template. Should it choose this option, the third-party shall make the Farm Evaluation Template available to its Members within 30-days of receiving the final Farm Evaluation Template as provided by the Central Valley Water Board's Executive Officer. Requirements for the Farm Evaluation Template are described in Attachment B MRP section VI.A., or

c. Farm Evaluation Template Group Option

The third-party may develop a Farm Evaluation Template with other agricultural water quality coalitions and agricultural commodity groups. Should it choose the group option, the third-party shall submit a Farm Evaluation Template to the Central Valley Water Board within 90-days from receiving an NOA from the board. The third-party shall make the Farm Evaluation Template available to its Members within 30-days of approval by the Executive Officer. Requirements for the Farm Evaluation Template are described in Attachment B MRP section VI.A.

2. Irrigation and Nitrogen Management Plan (INMP) and INMP Summary Report Templates

Template development shall be in accordance with the requirements specified in Attachment B MRP section VI.B to this Order. Templates will be developed as follows:

a. Central Valley Water Board INMP Template and INMP Summary Report

An Irrigation and Nitrogen Management Plan (INMP) Template and INMP Summary Report meeting the requirements of Attachment B MRP section VI.B is provided for use in Attachment B MRP, Appendix MRP-4.

b. Third-Party INMP Template and INMP Summary Report
The third-party may work with Central Valley Water Board staff in the development of an INMP Template and INMP Summary Report. Should it choose this option, the third-party shall make the INMP Template and INMP Summary Report available to its Members within 30-days of receiving the final INMP Template and INMP Summary Report as provided by the Central Valley Water Board's Executive Officer. Requirements for the INMP Template and INMP Summary Report are describe in Attachment B MRP section VI.B, or

c. INMP Template and INMP Summary ReportGroup Option
The third-party may develop an INMP Template and INMP Summary Report with other agricultural water quality coalitions and agricultural commodity groups. Should it choose the group option, the third-party shall submit the INMP Template and INMP Summary Report to the Central Valley Water Board's Executive Officer within 90-days from receiving an NOA from the board. The third-party shall make the INMP Template and INMP Summary Report available to its Members within 30-days of approval by the Central Valley Water Board Executive Officer. Requirements for the INMP Template and INMP Summary Report are described in Attachment B MRP section VI.B.

3. Sediment and Erosion Control Plan Template

Template development shall be in accordance with the requirements specified in Attachment B MRP section VI.B. Templates will be developed as follows:

a. Sediment and Erosion Control Plan Template Group Option

The third-party may develop a Sediment and Erosion Control Plan Template with other agricultural water quality coalitions and agricultural commodity groups. Should it choose the group option, the third-party shall submit the Sediment and Erosion Control Plan Template to the Central Valley Water Board's Executive Officer within 90-days from receiving an NOA from the board. The third-party shall make the Sediment and Erosion Control Plan Template available to its Members within 30-days of approval by the Central Valley Water Board Executive Officer. Requirements for the Sediment and Erosion Control Plan Template Group Option are described in MRP section VI.C, or

b. Central Valley Water Board Sediment and Erosion Control Plan Template

The third-party shall work with Central Valley Water Board staff in the development of a Sediment and Erosion Control Plan Template. Should it choose this option, the third-party shall make the final Sediment and Erosion Control Plan Template available to those Members required to develop a Sediment and Erosion Control Plan within 30-days of receiving the final

Sediment and Erosion Control Plan Template as provided by the Central Valley Water Board's Executive Officer.

D. 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 Assessment Report, (3) a Management Practices Evaluation Program, and (4) a Groundwater Quality Trend Monitoring Program. Each of these elements has its own specific objectives briefly described below, with more detail provided in the attached MRP.

1. Drinking Water Supply Well Monitoring

Due to the potential severity and urgency of health issues associated with drinking groundwater with high concentrations of nitrates, the third-party, on behalf of Members, may conduct testing and monitoring of all drinking water supply wells present on the Members' property. If a well is identified as exceeding the MCL for nitrate, the third-party or Member must notify the Central Valley Water Board. The Member, or the Central Valley Water Board, must then notify 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 where discharges from irrigated lands may result in groundwater quality degradation;[31]
- Establish priorities for implementation of monitoring and associated studies;
- 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 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

Workplan. The workplan must meet the goals, objectives, and other requirements described in Attachment B MRP section IV. 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). 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 larger 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 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.

The MPEP Group Workplan shall be submitted to the Central Valley Water Board within two (2) years after written approval of the GAR by the Executive Officer.

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.

E. 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 VII.

F. 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.D.

G. 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.

H. 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 toward 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.

For newly triggered SQMP/GQMPs, the third-party shall submit a SQMP/GQMP to the Central Valley Water Board within sixty (60) days. For any SQMP or GQMP that addresses salt or nitrates, the SQMP or GQMP shall also be submitted to the Chair of the CV-SALTS Executive Committee. This 60-day period begins the first business day after the 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. Members shall comply with the management plans once they are approved by the Executive Officer.

The third-party shall ensure continued implementation of SQMP/GQMPs until 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[32]) 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 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.

b. Groundwater Quality Management Plan (GQMP)

A GQMP shall be developed by the third-party where: (1) there is a confirmed exceedance[33] (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) 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, upon consideration of State Water Board Hydrogeologically Vulnerable Areas and the Department of Pesticide Regulation Groundwater Protection Areas, 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. Additionally, a GQMP may be developed by the third-party in high vulnerability areas previously designated and approved as a part of the GAR.

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 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) or the Executive Officer determines that the exceedance is not likely to be remedied or addressed by a management plan.

4. Comprehensive Groundwater Quality Management Plan

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

I. 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.

J. 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 and groundwaters.

K. 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.

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 R5-2012-0116-R4, 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 identified below, or by a duly authorized representative of that person:

For all reports:

a. For a sole proprietorship: by the proprietor;
b. For a partnership: by a general partner;

c. For a corporation or the third-party: by a principal executive officer of at least the level of senior vice-president.

A person is a duly authorized representative only if:

i. The authorization is made in writing by a person described in subsection a, b, or c of this provision; and

ii. The authorization specifies either an individual or a position having responsibility for the overall operation of the facility or organization, such as the position of manager. A duly authorized representative may thus be either a named individual or an individual occupying a named position; and

iii. The written authorization is submitted to the Central Valley Water Board.

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, 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 unredacted 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, all reports submitted by Members 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 and INMP Summary Reports in a secure offsite location managed by an 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. 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.H, Members may request and submit for approval to the Central Valley Water Board a time schedule ~~the following time schedules shall apply as appropriate in order to allow Members sufficient time~~ to achieve compliance with the surface or~~and~~ groundwater receiving water limitations described in section III of this Order. ~~The~~ Proposed time schedules must be as short as practicable, and must be supported with appropriate technical and economic justification as to why they are as short as practicable. The Central Valley Water Board must~~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 supersede SQMP-or~~s the~~ GQMP-established 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 compliance with Surface Water Limitation III.A 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 compliance with Groundwater Limitation III.B must be as short as practicable, but may not exceed 10 years from the date the GQMP is submitted for approval by the Executive Officer. The proposed time schedules in the GQMP must be supported with appropriate technical or economic justification as to why the proposed schedules are as short as practicable.~~

This Order becomes effective on 7 December 2012 and remains in effect as revised on 17 April 2015 unless rescinded or further revised by the Central Valley Water Board.

I, PAMELA C. CREEDON, Executive Officer, do hereby certify the foregoing is a full and correct copy of an Order adopted by the California Regional Water Quality Control Board, Central Valley Region on
7 December 2012, and revised on 3 October 2013, 27 March 2014, and 17 April 2015.

Original signed by

PAMELA C. CREEDON,

Executive Officer

Figure 1. Map of the Eastern San Joaquin River Watershed Area.

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[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 Water Code, but that irrigation water may contain constituents that are considered to be a “waste” as defined by Water Code section 13050(d).

[2] 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.

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

[4] Data are for Madera, Mariposa, Merced, Stanislaus, and Tuolumne Counties; United States Department of Agriculture. 2012. *Census of Agriculture*.

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

[6] 2008-2010 303(d) List.

[7] 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.

[8] PEIR, Appendix A

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

[10] 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 Eastern San Joaquin River Watershed).

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

[12] 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
[13] 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>
[14] California Department of Food and Agriculture. 2013. Nitrogen Tracking and Reporting Task Force Final Report. <https://www.cdfa.ca.gov/environmentalstewardship/PDFs/NTRSTFFinalReport122013.pdf>
[15] 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
[16] 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).
[17] These limitations are effective immediately except where Members are implementing an approved Surface Water Quality Management Plan (SQMP) for a specified waste parameter in accordance with an approved time schedule authorized pursuant to sections VIII.H and XII of this Order.
[18] These limitations are effective immediately, except where Members are implementing an approved Groundwater Quality Management Plan (GQMP) for a specified waste parameter and have been granted an extension in accordance with an approved time schedule authorized pursuant to sections VIII.H and XII of this Order.
[19] 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.
[20] 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.
[21] Nitrogen Management Plans are prepared in advance of the crop season, and based on circumstances that are forecasted. However, due to changes in weather, water availability, and other unanticipated circumstances, growers may find it necessary to adjust the Nitrogen Management Plan as originally prepared. Such adjustments are not considered to be violations of the Order, provided the revision maintains compliance with provision of this Order. Should such adjustments be necessary, the member must document the reasons for adjustments in the Nitrogen Management Plan retained at the grower's place of business and report the reasons to the third-party with the Nitrogen Management Plan retained at the grower's place of business and report the reasons to the third-party with the Nitrogen Management Plan Summary Report (if applicable).
[22] As defined in Attachment B MRP Section V.E
[23] If a Member was not required to prepare a Farm Evaluation by 1 March 2015 under this order prior to revisions by the State Water Board, that Member's deadline shall be as follows:

> By 1 March 2017, Members with Medium or Large Farming Operations must prepare and implement a Farm Evaluation and submit it to the third-party. An updated Farm Evaluation must be prepared and submitted to the third-party by 1 March annually thereafter. As part of the Farm Evaluation, the Member shall provide information on any outreach activity participation in accordance with section IV.B.4 of this order.

[24] Irrigation and Nitrogen Management Plans are prepared in advance of the crop season, and based on circumstances that are forecasted. However, due to changes in weather, water availability, and other unanticipated circumstances, growers may find it necessary to adjust the Irrigation and Nitrogen Management Plan as originally prepared. Such adjustments are not considered to be violations of the Order, provided the revision maintains compliance with provision of this Order. Should such adjustments be necessary, the member must document the reasons for adjustments in the Irrigation and Nitrogen Management Plan retained at the grower's place of business and report the reasons to the third-party with the Irrigation and Nitrogen Management Plan Summary Report.

[25] 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.

[26] As defined in Attachment E.

[27] As defined in Attachment E.

[28] 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.

[29] As defined in Attachment B MRP Section V.E

[30] If a Member was not required to prepare an INMP by 1 March 2015 under this order prior to revisions by the State Water Board, that Member's deadline shall be as follows:

> By 1 March 2017, Members with Medium or Large Farming Operations shall prepare and implement an INMP. By 1 March 2018, and annually thereafter Members with Medium or Large Farming Operations shall prepare and implement a certified INMP and submit to the third-party the INMP Summary Report for the previous year.

[31] If the third-party has already designated high vulnerability areas as part of a previously prepared GAR, these designations may continue to be used to prioritize groundwater quality monitoring, evaluation, and management planning efforts.

[32] 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 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.

[33] 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 exceedance 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.

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
CENTRAL VALLEY REGION

Attachment A to Order R5-2012-0116-R4~~3~~
INFORMATION SHEET

WASTE DISCHARGE REQUIREMENTS GENERAL ORDER
FOR
GROWERS WITHIN THE EASTERN SAN JOAQUIN RIVER WATERSHED
THAT ARE MEMBERS OF THE THIRD-PARTY GROUP

Table of Contents

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Overview

This attachment to Waste Discharge Requirements General Order for Growers within the Eastern San Joaquin River Watershed that are Members of the Third-Party group, Order R5-2012-0116-R43 (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.

Introduction

There are numerous irrigated agricultural operations within the boundaries of the 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 Regional Water Quality Control Board Irrigated Lands Regulatory Program (ILRP) was initiated in 2003 with the adoption of a conditional waiver of WDRs for discharges from irrigated lands. The 2003 conditional waiver was renewed in 2006. 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 2006).

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 board staff to develop an environmental impact report for a long-term ILRP that would protect waters of the state (groundwater and surface water) from discharges of waste from irrigated lands. Although the requirements of the conditional

waiver are aimed to protect surface water bodies, the directive to develop a long-term ILRP and environmental impact report is not as limited, as waters of the State include ground and surface waters within the State of California (CWC, Section 13050[e]).

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

In fall 2008, the Central Valley Water Board convened the Long-Term ILRP Stakeholder Advisory Workgroup (Workgroup). The Workgroup included a range of stakeholder interests representing local government, industry, agricultural coalitions, and environmental/environmental justice groups throughout the Central Valley. The main goal of the Workgroup was to provide Central Valley Water Board staff with input on the development of the long-term ILRP. Central Valley Water Board staff and the Workgroup developed long-term program goals and objectives and a range of proposed alternatives for consideration in a 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 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 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. In addition, the board intends to develop a general order for irrigated lands owners/operators that are not part of a third-party group.

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~~

[1] ICF International. 2011. Irrigated Lands Regulatory Program, Program Environmental Impact Report. Draft and Final. March. (ICF 05508.05.) Sacramento, CA. Prepared for Central Valley Regional Water Quality Control Board, Sacramento, CA.
[2] ICF International. 2010. Draft Technical Memorandum Concerning the Economic Analysis of the Irrigated Lands Regulatory Program) (Economics Report).

~~provisions to reduce the reporting requirements for small farming operations and areas of low vulnerability. The Eastern San Joaquin River Watershed General Order is the first of these orders to be considered by the board.~~

Goals and Objectives of the Irrigated Lands Regulatory Program

The goals and objectives of this Order, which implements the long term ILRP in the Eastern San Joaquin 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.*
- *Ensure agricultural operations are mitigating the impacts of nitrates upon resident's beneficial uses of waters of the state.*
- *Coordinate with other Central Valley Water Board programs, such as the Grasslands Bypass Project WDRs for agricultural lands total maximum daily load development, CV-SALTS, and WDRs for dairies.*
- *Promote coordination with other regulatory and non-regulatory programs associated with agricultural operations (e.g., DPR, the California Department of Public Health [DPH] Drinking Water Program, the California Air Resources Board [ARB], the California Department of Food and Agriculture, Resource Conservation Districts [RCDs], the University of California Extension, the Natural Resources Conservation Service [NRCS], the USDA National Organic Program, CACs, State Water Board Groundwater Ambient Monitoring and Assessment Program, the U.S. Geological Survey [USGS], and local groundwater programs [SB 1938, Assembly Bill [AB] 3030, and Integrated Regional Water Management Plans]) to minimize duplicative regulatory oversight while ensuring program effectiveness."*

[3] PEIR, page 2-6

Description of the Eastern San Joaquin Watershed Area[4]

The Eastern San Joaquin Watershed area includes portions of Stanislaus, Merced, Calaveras, Fresno, and Alpine Counties, as well as the entire counties of Madera, Tuolumne, and Mariposa. See Figure 1 of the Order for a map of the area. There are approximately 1,000,000 acres of irrigated agricultural land within the watershed area, although approximately 165,000 of these acres are regulated under the Central Valley Water Board's General Order for Existing Milk Cow Dairies. See Table 1 below for more detailed acreage information.

Surface water flows northward and out of the watershed area via the San Joaquin River. The San Joaquin drains watersheds on the east and west side of the San Joaquin Valley, though only east side watersheds are included in this Order's watershed area. In addition to the San Joaquin River, which forms the southern and western boundary of the watershed, there are five major rivers in the watershed: the Fresno River, the Chowchilla River, the Merced River, the Tuolumne River and the Stanislaus River. In addition, the Eastside Bypass is considered a major waterbody. These eastern tributaries of the San Joaquin River drain the Sierra Nevada range from east to west. The region also contains all or portions of seven groundwater basins; see Figure 5 for a map of the groundwater basins.

The Eastern San Joaquin River Watershed area includes portions of two geomorphic provinces: the Sierra Nevada and Great Valley provinces. The San Joaquin Valley, part of the Great Valley, is a large sediment-filled trough, thousands of feet thick in some locations (Figure 1, Thiros 2010).[5] Scattered throughout the sediment-filled trough in the subsurface exist many lenses at varying depths of fine-grained deposits, including Corcoran Clay deposits, which form confining layer(s) (Figure 2, Bertold, Johnston, Evenson 1991).[6] Figure 3 from Thiros 2010 is a generalized diagram of the Central Valley, showing the basin-fill deposits and the components of the groundwater system under modern conditions.

[4] This section is adapted from the East San Joaquin Water Quality Coalition's 20 October 2010 Monitoring and Reporting Program Plan.

[5] 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.

[6] Bertold, G.L., Johnston, R.H., Evenson, K.D. 1991. Groundwater in the Central Valley, California—A summary report. United States Geological Survey Professional Paper 1401-A.

Figure 1. Generalized Geology of the Eastern San Joaquin River Watershed – adapted from Thiros (2010)

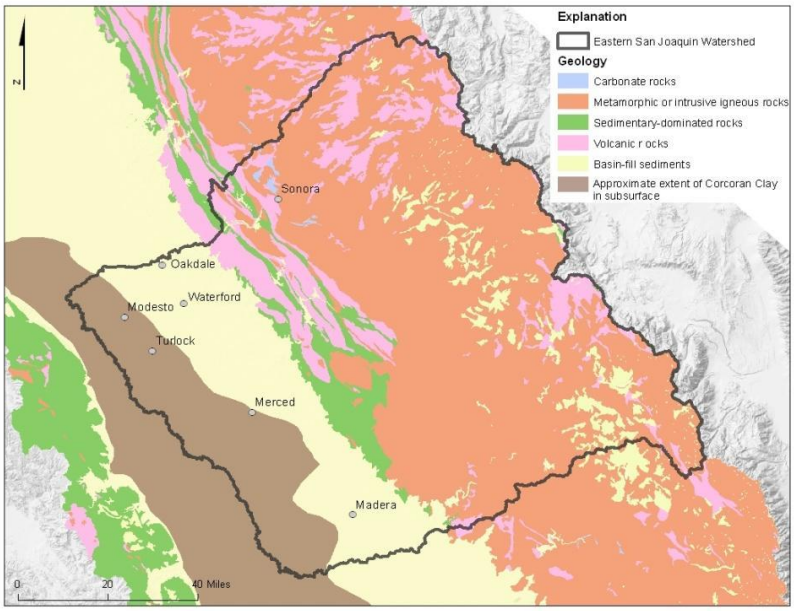
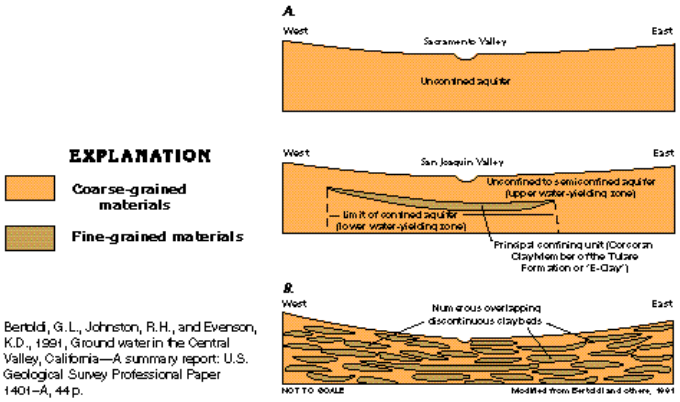


Figure 2. Cross-sectional Diagram of Groundwater Confining Layers in the San Joaquin Valley – Bertold, Johnston, and Evenson (1991)

Figure 78. According to early concepts of the aquifer system (A), it was generally considered to be unconfined in the Sacramento Valley and confined where the Corcoran Clay Member of the Tulare Formation, or "E-clay," is present in the San Joaquin Valley. However, recent studies suggest that the entire aquifer system is a single heterogeneous system (B) in which vertically and horizontally scattered lenses of fine-grained materials provide increasing confinement with depth.



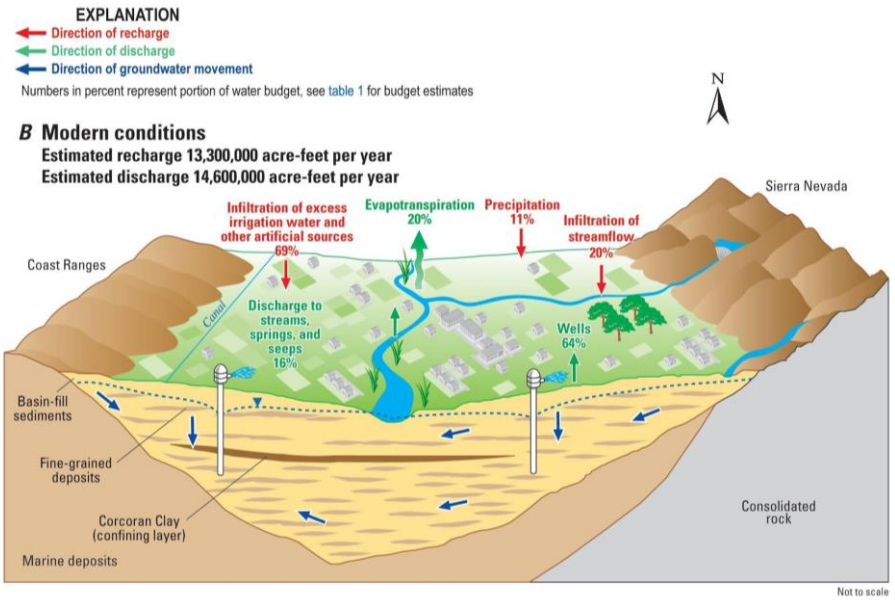
Bertoldi, G.L., Johnston, R.H., and Evenson, K.D., 1991, Ground water in the Central Valley, California—A summary report: U.S. Geological Survey Professional Paper 1401–A, 44 p.

From Tanji and Kielen (2002)[7]:

> The eastern side of the valley was formed from the alluvium of the Sierra Nevada, which consists mainly of granitic rocks. The soils derived from Sierran alluvium tend to be coarse textured and non-saline. The eastern groundwaters are characterized as low-salt calcium-bicarbonate-type water with total dissolved solids (*TDS*) typically in the 200-500 mg/litre range. In contrast, the soils on the western side were formed from alluvium of the Coast Range made up of uplifted marine sedimentary rocks. The soils on the western side tend to be finer textured and saline. The groundwaters on the western side are characterized as moderately saline sodium-sulphate-type waters with *TDS* typically in the 1 000-10 000 mg/litre range. The unconfined aquifer in both sides of the valley is gradually being filled up with decades of irrigation deep percolation. The soils in the valley and lowest part of the alluvial fans in the western side are waterlogged and salt affected. A nearly water-impermeable clay layer known as the Corcoran clay, about 200 m deep, serves as the boundary between the unconfined and confined aquifer. The groundwaters in the confined aquifer contain from 500 to 1 000 mg/litre TDS…

Figure 3. Generalized Diagram for the Central Valley, Showing the Basin-fill Deposits and Components of the Groundwater System under Modern Conditions – Thiros (2010)

[7] Tanji, K. and N. Kielen, 2002. Agricultural drainage water management in arid and semi-arid areas. FAO Irrigation and Drainage Paper 61, Food and Agriculture Organization of the United Nations, Rome.



Under Conditional Waiver Order R5-2006-0053, (Coalition Group Conditional Waiver) the East San Joaquin Water Quality Coalition (ESJWQC) divided the area into six zones based on hydrology, crop types, land use, soil types, and rainfall. Zone names are based on the Core Monitoring location within that zone: 1) Dry Creek at Wellsford Zone, 2) Prairie Flower Drain at Crows Landing Zone, 3) Highline Canal at Hwy 99 Zone, 4) Merced River at Santa Fe Zone, 5) Duck Slough at Gurr Rd Zone, and 6) Cottonwood Creek at Rd 20 Zone. See Table 1 for characteristics of each region. See Figure 4 for a map of the zones.

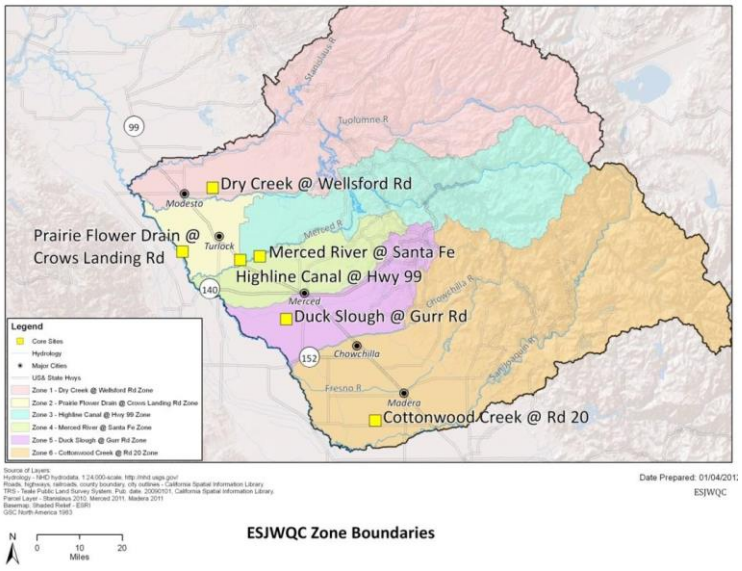
Table 1. Zone Characteristics in the Eastern San Joaquin River Watershed Area

	Zone 1 Dry Creek	Zone 2 Prairie Flower Drain	Zone 3 Highline Canal	Zone 4 Merced River	Zone 5 Duck Slough	Zone 6 Cottonwood Creek
Irrigated Acres	134,307	164,633	88,617	121,746	142,686	335,069
Soil (average %):						
Sand	56	71	62	59	40	64
Silt	25	19	24	25	36	22
Clay	18	10	15	16	24	14
Land Use (% of irrigated acres):						
Deciduous Fruits/Nuts	39	38	61	38	19	32
Field Crops	16	23	16	22	33	15
Grains/Hay	1	1	2	4	6	4
Pasture	35	31	11	20	31	13
Vineyard	4	3	9	6	2	31
Dairies:						
% of irrigated acres	15	28	12	20	23	10

Number of operations	109	270	25	72	56	49
Depth to Groundwater:						
Weighted Average, feet	49	30	138	46	69	120
Annual average precipitation in the San Joaquin Hydrologic Region is 20 inches.[8]						

The top ten crops based on 2010 total harvested acreage in the San Joaquin River Watershed are (listed in decreasing order): almonds, hay, silage, corn, grapes, tomatoes, irrigated pasture, wheat, cotton and walnuts. This list includes the acreage on both sides of the San Joaquin River, so does not necessarily represent the top ten crops for the Eastern San Joaquin River Watershed area covered by this Order. There were over 100 crops grown in the Eastern San Joaquin River Watershed in 2010.

Figure 4. ESJWQC Zone Boundaries



East San Joaquin Water Quality Coalition (ESJWQC) Organization

The ESJWQC 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 ESJWQC'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

[8] California Department of Water Resources, Division of Flood Management, Regional Climate Data. December 2012 – Revised October 2013 and [Month Year]

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 ESJWQC will continue to operate as the third-party lead entity under this Order.

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, as well as growers needing membership, will have a 120-day period (after the NOA is issued by the Executive Officer for the third-party) to complete enrollment before additional requirements are initiated. Members in good standing will submit a one-page Notice of Confirmation (NOC) to the third-party, confirming that they would like to continue membership in the third-party and that they are familiar with the Order's requirements. Other growers will submit a membership application to the third-party and will be notified by the third-party when their membership is approved. This will streamline the initial enrollment process for the bulk of the irrigated agricultural operations within the Eastern San Joaquin River Watershed.

Growers that do not enroll within the 120-day enrollment period, 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.

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. Board staff will conduct enforcement activities as needed using the list of revoked/pending revocations.

~~**Groundwater Quality 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.~~

~~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 R5-2012-0116-R3). The Executive Officer will make the final determination regarding the irrigated lands waste discharge vulnerability areas.~~

Surface Water and Groundwater Monitoring

Surface Water Quality Monitoring

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

The ESJWQC has been operating under a Monitoring and Reporting Program Plan (MRP Plan) prepared according to the Monitoring and Reporting Program Order R5-2008-0005 for Coalition Groups under the amended Coalition Group Conditional Waiver of Waste Discharge Requirements for Discharges from Irrigated Lands Order R5-2006-0053. The MRP Plan, together with the ESJWQC'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.

Under previous MRP Order R5-2008-0005, the ESJWQC conducted three types of water quality monitoring: Core, Assessment, and Special Project. Monitoring design was specific to each of the six zones designated in 2008 by the ESJWQC within the Eastern San Joaquin River Watershed. The zone designations were based on hydrology, crop types, land use, soil types, and rainfall. Each zone contained one Core Monitoring site and several Assessment Monitoring sites that would rotate every two years. Core Monitoring was designed to evaluate general water quality trends over time at the Core sites and included general physical parameters, nutrients, and pathogens. Assessment Monitoring rotated through Assessment sites and included analyses for a large suite of constituents. Core Monitoring sites underwent Assessment Monitoring every three years. Special Project Monitoring occurred when the requirement for a management plan was triggered and additional data were needed to identify sources of the exceedances, as well as to assess water quality improvement due to implementation of management practices. Special Project Monitoring also occurred in areas where total maximum daily load (TMDL) studies are required by the Basin Plan.

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

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?[9] 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 "Core" and "Represented" monitoring sites cover represented sections of the Eastern San Joaquin 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. Both "special project" monitoring associated with management plans and the monitoring conducted at "Core" monitoring sites should be sufficient to allow for the evaluation of trends. The requirements to gather information on management practices will provide additional information to help estimate whether any changes in trends may be associated with the implementation of practices.
4. The surface water monitoring required should allow for a determination as to whether discharges from 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 effective. In addition, information

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

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 R5-2012-0116-R4~~3~~ (MRP) has been developed using the ESJWQC's August 2008 MRP Plan as a foundation. However, a number of changes were made to improve the cost-effectiveness of the surface water monitoring effort and ensure the data collected are the most appropriate for answering the monitoring questions.

The four primary changes were to: 1) eliminate the set frequency for monitoring; 2) eliminate the set parameter list for metals and pesticides; 3) change approach to trend monitoring to focus on parameters associated with irrigated agricultural waste discharges; and 4) modify the monitoring approach at previous "Core" and "Rotating" sites.

The rationale for the above changes are:

1) The previous requirement to monitor monthly resulted in monitoring during months in which no problems would be expected and infrequent monitoring during peak periods when potential problems could occur. The third-party will be required to evaluate pesticide use patterns and peak times when metals from irrigated agriculture operations may cause problems in surface water. Based on that evaluation, they will propose a frequency and time period to conduct monitoring that will adequately characterize surface waters receiving irrigated agricultural waste discharges.
2) The set list of parameters resulted in monitoring of some pesticides and metals that are unlikely to result in water quality problems. Also, in some cases pesticides that could cause or contribute to a water quality problem were not monitored. 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. Board staff will work with DPR, third-party groups, and engage the ILRP Technical Issues Committee (TIC) to develop a process for selecting the list of pesticides and specific pesticides for monitoring by the third-party.
3) 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 as part of management plan monitoring and through more frequent monitoring at "Core" sites.
4) The previous requirement included monitoring a broad suite of parameters once every three years on a monthly monitoring schedule. The "trigger" for requiring preparation of a management plan is more than one exceedance every three years. The previous approach reduces the likelihood of identifying and addressing a problem, especially if a problem is primarily prevalent in a single month – a management plan might never be triggered. In addition, by not sampling a broad suite of parameters two out of three years, significant problems related to hydrology or climate could be missed – for example, heavy pest pressure in a non-monitored

year could result in heavy pesticide use and higher discharge that would not be identified. The new MRP requires two years of monitoring/two years off at the "Core" monitoring sites (any monitoring triggered by management plans would continue even if a site had an "off" year for monitoring). This approach will ensure that each "zone" includes one or more sites in which comprehensive assessment monitoring is being conducted, which should allow the board to track and identify any significant changes, while not imposing an undue cost burden.

5) The previous monitoring program included a set schedule for monitoring at previously identified "Rotating" sites. The MRP for this Order does not establish a set schedule for monitoring "Rotating" sites. Instead, the third-party will monitor two "Core" sites per zone with monitoring at additional sites ("Represented" monitoring sites) when "Core" site monitoring indicates that there is a water quality problem or as part of special studies and management plans. This change will facilitate a better process for targeted follow-up monitoring where there are water quality problems.

Surface Water Management Plans

Since 2004, the ESJWQC has collected water quality monitoring data at 47 sites. 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[10] more than one time in a three year period. There are currently surface water management plans required for the following constituents: ammonia, arsenic, chlorpyrifos, copper, DDE, diazinon, diuron, dissolved oxygen, electrical conductivity, *E. coli*, lead, molybdenum, nitrate, pH, simazine, total dissolved solids, thiobencarb, algae toxicity, sediment toxicity to *Hyalella azteca*; and water column toxicity to algae (*Selenastrum capricornutum*), fathead minnows (*Pimephales promelas*), and water fleas (*Ceriodaphnia dubia*). The ESJWQC's Management Plan, which covers all of these constituents, was approved on 25 November 2008 and is updated annually. Table 2 provides a brief summary of the water quality sampling results for these constituents. This Order requires the ESJWQC's 2008 Management Plan to be implemented.

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

Table 2. Summary of ILRP Surface Water Monitoring Data for Management Plan Constituents in the Eastern San Joaquin River Watershed, 2004 through 2010

Constituent	No. of sites requiring a management plan	Range of detected levels	Number of exceedances	Trigger limit
Pesticides				
Chlorpyrifos	23	ND[1] to 3.7 ug/L	90	0.015 ug/L
DDE	1	ND to 0.022 ug/L	4	0.00059 ug/L
Diazinon	1	ND to 0.24 ug/L	3	0.1 ug/L
Diuron	5	ND to 68 ug/L	17	2 ug/L
Simazine	2	ND to 25 ug/L	5	4 ug/L
Thiobencarb	1	ND to 5.8 ug/L	3	Must not be detected (ND)
Toxicity				
Water, *Selenastrum*	18	1.8% to 100% growth [2]	82	Reduction in growth [2, 3]
Water, *Pimephales*	3	0% to 100% survival [2]	12	Reduction in survival [2, 3]
Water, *Ceriodaphnia*	12	0% to 100% survival[2]	48	Reduction in survival [2, 3]
Sediment, *Hyalella*	13	0% to 100% survival[2]	55	Reduction in survival [2, 3]
Metals (total)				
Arsenic	4	ND to 30 ug/L	31	10 ug/L
Copper	17	0.4 to 120 ug/L	13	Variable[4]
Lead	11	ND to 24 ug/L	69	Variable[4]
Molybdenum	1	0.25 to 6.8 ug/L	5[5]	Variable[4]
Nutrients & Salts				
Ammonia	5	ND to 155.4 mg/L	27	Variable[6]
Nitrate as N	6	ND to 68 mg/L	63	10 mg/L
Total dissolved solids	8	<4 to 2,900 mg/L	126	450 mg/L
Electrical conductivity	12	<1 to 4,798 uS/cm	193	700 uS/cm
Other				
Dissolved oxygen	21	0 to 25.9 mg/L	335	>5 or >7 mg/L
E. coli	27	0 to 2,400 MPN/100mL	340	235 MPN/100mL
pH	15	5.02 to 9.7	81	>8.5 or <6.5

[1] ND = Not detected at measurable levels
[2] Compared to the control sample
[3] And statistically significant
[4] Hardness-dependent water quality objectives
[5] This management plan and associated 5 exceedances occurred in 2011
[6] Water quality objectives are dependent on pH and temperature

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. 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 Limitation III.A. The limitations apply immediately unless the Member is implementing the SQMP in accordance with the approved time schedule. 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 partially or fully 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 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; 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. The Central Valley Water Board must be informed of the efforts being undertaken by irrigated agricultural operations to address identified surface water quality problems. In addition, a regional SQMP is a reasonable first step to address identified surface water quality problems, since 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. 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.

Groundwater Quality

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.

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

The workgroup members reached consensus that the most important constituents of concern related to agriculture's impacts to the beneficial uses of groundwater are nitrate (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.

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 ~~their 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.

Data Summary, Pesticides

Monitoring data collected for two studies conducted by the State Water Resources Control Board and the USGS in 2006 and 2008 showed detections of pesticides used by agriculture in groundwater within the Eastern San Joaquin River Watershed.[11] Pesticides and pesticide degradates were detected in 59 percent of wells in the Central-Eastside San

[11] Landon, M.K., and Belitz, K., 2008. Ground-water quality data in the Central Eastside San Joaquin Basin 2006: Results from the California GAMA Program: U.S. Geological Survey Data Series 325, 88 p. See also Shelton, J.L., Fram, M.S., and Belitz, K., 2009. Groundwater-quality data for the Madera–Chowchilla study unit, 2008: Results from the California GAMA program: U.S. Geological Survey Data Series 455, 80 p. Available at http://pubs.usgs.gov/ds/455.

Joaquin Basin in 2006 and 30 percent of wells in the Madera-Chowchilla Study Unit in 2008. Most frequently detected pesticides in the studies include deethylatrazine (degradate of triazine herbicides), simazine, atrazine, metolachlor, DBCP, and deisopropylatrazine (degradate of triazine herbicides). Most 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. 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 359,000 acres of irrigated lands in the Eastern San Joaquin River Watershed within DPR Groundwater Protection Areas (GWPAs). Of the 359,000 acres, approximately 236,000 acres of the irrigated lands are within DPR GWPAs that are characterized as vulnerable to leaching of pesticides (leaching areas), approximately 120,000 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 2,510 acres of irrigated lands are characterized as both leaching and runoff areas. See Figure 5 for a map of the Groundwater Protection Areas within the Eastern San Joaquin 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 GQMP.

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 GeoTracker GAMA. In January 2012 there were 35,640 nitrate results in GeoTracker GAMA within the Eastern San Joaquin River Watershed Area. These results were collected from environmental monitoring wells and water supply wells (94 percent of the samples were collected from water supply wells). The samples considered in this summary were collected from 1978 through 2011, although 84 percent of the samples were collected in years 2000 or later. There is only one nitrate sample in the GAMA database collected prior to 1979 (for the Eastern San Joaquin River Watershed area). Samples were collected

within all 6 counties in the Eastern San Joaquin River Watershed, although most were collected in Stanislaus (62 percent), Merced (14 percent), and Madera (12 percent) Counties.

Sample collection depth information is not available for download from GeoTracker GAMA. However, 86 percent (30,807) 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 35,639 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.

Six percent of sample results for all GAMA well data for the Eastern San Joaquin River Watershed were greater than the nitrate drinking water standard of 45 mg/L (as nitrate). An additional 34 percent of results fell between the drinking water standard and half of the standard (22.5 mg/L).

Of the 5,601 samples collected from 1979 through 1999, 9 percent were greater than the nitrate drinking water standard and an additional 29 percent fell between the drinking water standard and half of the standard. Of the 30,038 samples collected 2000 through 2011, 6 percent were greater than the nitrate drinking water standard and an additional 35 percent fell between the drinking water standard and half of the standard.

All nitrate results collected between 1979 and 1999 were reported by DPH. Of the 4,832 nitrate results reported by groups other than DPH that were collected 2000 through 2011, 14 percent were greater than the nitrate drinking water standard and an additional 17 percent fell between the standard and half of the standard.

There were 1,004 square-mile sections of land (township, range, and section or TRS) within the Eastern San Joaquin River Watershed Area with nitrate results in the GeoTracker GAMA dataset. When data were analyzed per TRS, three percent of sampled sections had an average nitrate level above the drinking water standard and an additional 18 percent of sections had an average nitrate level between 45 and 22.5 mg/L. Twenty-two percent of sampled sections had a maximum nitrate level above 45 mg/L and an additional 28 percent of sampled sections had a maximum level between 45 and 22.5 mg/L. See Figure 6 for a map showing the maximum nitrate result per square mile section of land with detections.

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 Figure 5 for a map of the HVA areas within the third-party region.

Groundwater Quality Management Plans (GQMPs)

Under this Order, ~~groundwater quality management plans~~ GQMPs will be required where there are exceedances of water quality objectives, the Basin Plan requires development of GQMP, or the Executive Officer determines that irrigated agriculture may be causing or contributing to exceedances of water quality objectives or where there is a trend of degradation[12] 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)~~. Additionally, a GQMP may be developed by the third-party in high vulnerability areas previously designated and approved as a part of the GAR. 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 Groundwater Receiving Water Limitation III.B. The limitations apply immediately unless the Member is implementing the GQMP in accordance with the approved time schedule. The GQMP will include a schedule and milestones for the implementation of management practices (see Appendix MRP-1), including requirements for the mitigation of nitrate impacts upon beneficial uses, such as the provision of replacement water and longer-term solutions such as treatment of contaminated water. 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. If the identification of practices necessary to meet receiving water limitations cannot be accomplished in the time schedule identified in Order R12-2012--116-R4, Section XII, the GQMP will identify interim targets and milestones for meeting the receiving water limitations. 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 applied~~available~~ to total nitrogen removed~~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 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,

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

develop a strategy with schedules and milestones to implement practices to ensure discharge from irrigated lands are meeting Groundwater Receiving Water Limitation III.B, D) develop a monitoring strategy to provide feedback on GQMP progress, E) develop methods to evaluate data collected under the GQMP, F) determine the best mechanisms to mitigate the impacts of nitrates upon community's beneficial uses and G~~F~~) provide reports to the Central Valley Water Board on progress.

Elements A –G-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), implement mechanisms to ensure communities are not unfairly burdened by niitrate contamination (element F), and facilitate efficient board review of data collected on the progress of the GQMP (element G~~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. The Central Valley Water Board must be informed of the efforts being undertaken by Members to address identified groundwater quality problems. In addition, a regional GQMP is a reasonable first step to address identified groundwater quality problems, since 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. 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.

Farm Evaluations

The Order requires that all Members complete a farm evaluation describing management practices implemented to protect surface and groundwater quality. The evaluation will also include 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.

In Attachment B MRP, Appendix MRP-3 is the Farm Evaluation Template for Member use.
~~The Order requires development of a farm evaluation template to assist Members in~~

~~completing the evaluation.~~ If they so choose, the third-party may independently, or in cooperation with other agricultural water quality coalitions and agricultural commodity groups, develop a farm evaluation template which may be made available to Members for use once approved by the Executive Officer. ~~Once the Executive Officer approves the final template, all Members will be required to complete a farm evaluation.~~ The Order establishes prioritization for Member completion and updating of the evaluations based on farm size ~~and 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 regional surface and groundwater monitoring to determine compliance with water quality objectives. The regional monitoring cannot determine whether all Members are implementing protective practices, such as wellhead protection measures for groundwater. Regional monitoring also does not allow identification of which practices are protective in areas where impacts are observed and multiple practices are employed. 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 assurance that Members are implementing management practices to protect groundwater quality while trend data 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 Members are complying with the Order.

~~The focus of the reporting is on parcels in high vulnerability areas. The 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 sizes of farming operations ~~in high vulnerability areas~~. ~~The reporting frequency is every five years for all farming operations in low vulnerability areas, however, the first report for small farming operations in low vulnerability areas is not due until 2017.~~ 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. 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).~~

Irrigation and 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.[13] As shown in Figure 6, there are a number of wells within the Eastern San Joaquin 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 need. Proper nutrient management will work to reduce excess plant nutrients, such as nitrogen, from reaching state waters. Irrigation and ~~N~~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.

In Attachment B MRP, Appendix MRP-4 is the Irrigation and Nitrogen Management Plan (INMP) Template and INMP Summary Report for Member use. If they so choose, the third-party may independently, or in cooperation with other agricultural water quality coalitions and agricultural commodity groups, develop an irrigation and nitrogen management plan template and summary report, which may be made available to Members for use once approved by the Executive Officer. ~~This Order requires the development of a nitrogen management plan template to assist Members with nitrogen management. The template must be approved by the Executive Officer, and will either be proposed by the third-party according to the criteria listed in the Order, or will be developed by the staff in consultation with the third-party based on those same criteria. The template should consider, to the extent appropriate, the major criteria established in Code 590 of the NRCS Nutrient Management document, including soil and plant tissue testing, nitrogen application rates, nitrogen application timing, consideration of organic nitrogen fertilizer, consideration of irrigation water nitrogen levels to minimize surface and groundwater pollution and meet crop nitrogen requirements and crop yield potential.~~

~~Once the Executive Officer approves the nitrogen management plan template, a~~All Members ~~will be~~are required to complete an irrigation and nitrogen management plan according to the schedule in the Order which must be certified as directed in the Order. Additionally, all Members must complete and submit to the third-party an INMP Summary

[13] 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.

Report 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 submit summary reports in accordance with a schedule issued by the Executive Officer.~~

~~Members with small farming operations are given an additional two years to complete their first nitrogen management plan. 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[14] certified by the American Society of Agronomy, or Technical Service Providers certified in nutrient management in California by the National Resource 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. 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~~

[14] ~~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.~~

~~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 all 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 assurance that Members are managing nutrients to protect groundwater quality while trend data are collected.~~

~~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.~~

~~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 47 and the State Water Board's Report to the Legislature[15]).~~

~~In order to determine whether growers in a given township are improving their practices, the third-party will need to assess the data 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. Since a report on management practice information and nitrogen management summary reports will be provided annually, the board will be able to determine what the trends are, if any. 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 for individual Members.~~

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. 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

[15] ~~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></~~
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as pesticides. To ensure that water quality is being protected, this Order requires that sediment and erosion control plans be prepared in one of the following ways:

- 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 sediment and erosion control plan developer possessing one of the registrations shown in Table 3 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 3. 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)	Enviro Cert International Inc.
Certified Professional in Storm Water Quality™ (CPSWQ)	Enviro Cert International Inc.
Certified Soil Scientist	American Society of Agronomy

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 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.

The Order requires development of a sediment and erosion control plan template to assist Members and qualified developers in completing the plan. The Order establishes prioritization for Member completion of the plan based on farm size. Small farming operations will have additional time to complete the plan.

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.

~~**Small Farming Operations**~~

~~In counties within the Eastern San Joaquin River Watershed, small farming operations are operated by approximately 61 percent of the growers, but account for approximately 6% of the total irrigated lands.[16] During the development of the Order, concerns were raised regarding the ability of small farms to comply with the requirements of the Order. Although there were recommendations to exempt small farms from this Order, no evidence was provided to demonstrate that small farms could not affect water quality and, therefore, justify an exemption from being governed by waste discharge requirements. In addition, there was no evidence presented to suggest that, on a per acre basis, small farming operations would have a reduced impact on water quality then larger farmers.~~

~~However, the board recognizes that small farming operations have more limited resources and access to technical experts. The additional time provided for small farming operations to initially prepare applicable farm evaluations, nitrogen management plans, and sediment and erosion control plans should allow small farmers to more feasibly access available technical resources, such as their third-party, the Natural Resources Conservation Service, University of California Cooperative Extension, and local resource conservation districts.~~

~~These changes should not impact the board's ability to determine progress for the watershed as a whole, since most of the irrigated acreage in the watershed is managed by large farming operations. However, small farming operations may prove to have significant localized impacts, so this Order does not preclude the Executive Officer from obtaining information from small farming operations to address such impacts.~~

~~To accommodate differing requirements for small farming operations, the board needs to know who is farming a given parcel. Although the landowner can be the Member of the third-party, the landowner must still identify the lessee, if the landowner is not also the farmer. This requirement is necessary to avoid a situation in which multiple parcels of less than 60 acres are farmed by the same farming operation, but are incorrectly identified as associated with "small farming operations" based on the individual landowners being the Members rather than the farm operator.~~

Technical Reports

The surface water and trend groundwater quality monitoring under the Order is regional in nature instead of individual field discharge monitoring. The benefits of regional monitoring

[16] ~~Data are for Madera, Mariposa, Merced, Stanislaus, and Tuolumne Counties; United States Department of Agriculture. 20072012. *Census of Agriculture*.~~

include the ability to determine whether water bodies accepting discharges from numerous irrigated lands are meeting water quality objectives. Regional monitoring also allows the Central Valley Water Board to determine, at the regional level, whether practices are protective of water quality. There are limitations to regional monitoring when trying to determine possible sources of water quality problems.

Therefore, 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. In addition, Members must report the practices they are implementing to protect water quality. Through the evaluations and studies conducted by the third-party, the reporting of practices 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.

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.[17] The costs of individual monitoring would be much higher than regional surface and groundwater quality monitoring required under the Order. Regional monitoring provides a general measure of compliance over a large area, reducing the number of samples collected.

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 regional 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 regional monitoring requirements may be filled through targeted technical reports, instead of more costly individual monitoring programs.

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[18]. A variety of enforcement tools are available in response to noncompliance. The Enforcement Policy endorses the progressive enforcement approach

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

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

which includes an escalating series of actions from informal to formal enforcement. Informal enforcement actions are any enforcement taken by staff that is not defined in statute or regulation, such as oral, written, or electronic communication concerning violations. The purpose of informal enforcement is to quickly bring an actual, threatened, or potential violation to the discharger's attention and to give the discharger an opportunity to return to compliance as soon as possible. Formal enforcement includes statutorily based actions that may be taken in place of, or in addition to, informal enforcement. Formal enforcement is recommended as a first response to more significant violations, such as the highest priority violations, chronic violations, and/or threatened violations. There are multiple options for formal enforcement, including Administrative Civil Liabilities (ACLs) imposed by a Regional Water Board or the State Water Board. A 30-day public comment period is required prior to the settlement or imposition of any ACL and prior to settlement of any judicial civil liabilities.

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 this original Order in December 2012, staff sent letters to thousands of landowners who may now require regulatory coverage, since this 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 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.

Compliance/Enforcement Related to Water Quality Violations

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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.

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.

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 Dischargers and allows the Executive Officer to approve such reports. All plans and reports required for 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.

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). 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 and 64444 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 and 64444 and are applicable through the Basin Plan to municipal and domestic supply), and (2) narrative objectives including the chemical constituents, taste and odor, and toxicity objectives.

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

Implementation of Water Quality Objectives

The Basin Plan includes numeric and narrative water quality objectives. The narrative toxicity objective states: "*All waters shall be maintained free of toxic substances in concentrations that produce detrimental physiological responses in human, plant, animal, or aquatic life*." The Basin Plan states that material and relevant information, including numeric criteria, and recommendations from other agencies and scientific literature will be utilized in evaluating compliance with the narrative toxicity objective. The narrative chemical constituent objective states that waters shall not contain chemical constituents in concentrations that adversely affect beneficial uses. At a minimum, *"…water designated for use as domestic or municipal supply (MUN) shall not contain concentrations of chemical constituents in excess of the maximum contaminant levels (MCLs)*" in Title 22 of the California Code of 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 at page IV-16.00, contains an implementation policy, "Policy for Application of Water Quality Objectives," that specifies that the Central Valley Water Board "*will, on a case-by-case basis, adopt numerical limitations in orders which will implement the narrative objectives*." With respect to narrative objectives, the Regional Water Board must establish limitations using one or more of three specified sources, including: (1) USEPA's published water quality criteria, (2) a proposed state criterion (i.e., water quality objective) or an explicit state policy interpreting its narrative water quality criteria (i.e., the Regional Water Board's "Policy for Application of Water Quality Objectives"), or (3) an indicator parameter. For purposes of this Order, all three sources 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, board staff will develop trigger limits in consultation with the Department of Pesticide Regulation (for pesticides) and other agencies as appropriate. 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.

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."[19] The program goals and objectives include meeting water 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[20] and evaluated in the Program Environmental Impact Report (PEIR)[21] 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 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, reporting of the nitrogen applied and nitrogen removed data, and evaluation of effectiveness of implemented practices. This feedback will allow iterative

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

[20] 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.

[21] 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.

implementation of practices to ensure that program goals are achieved. This 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).

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

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)[22] 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

[22] 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

- 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 Eastern San Joaquin 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.
- 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.

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 R5-2012-0116-R4~~3~~.

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; regional monitoring and assessments to determine whether trends in degradation are occurring; and regional planning and on-farm implementation when trends in degradation 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 measures 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 irrigation and nitrogen management plan should result in achieving BPTC for nitrates discharged to groundwater.

Regional trend 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 (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 their Members. Failure to implement practices or address the degradation by individual Members 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 fulfill the requirements of Resolution 68-16 for any degradation of high quality waters authorized by this Order.

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.[23]

Administrative Procedures Update 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,"[24] 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

[23] 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.

[24] 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.

protect beneficial uses.[25] The Water Code directs the State Water Board and the Regional Water Boards to establish water quality objectives for the reasonable protection of beneficial uses. Therefore, where water bodies contain levels of water quality constituents or characteristics that are better than the established water quality objectives, such waters are considered high quality waters.

Both state and federal guidance 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.[26] 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 at 12. Additionally, if water quality conditions have improved historically, the current higher water quality would again be the point of comparison for determining the status of the water body as a high quality water.

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

Despite the lack of a BPTC definition, certain State Water Board water quality orders and other documents provide direction on the interpretation of BPTC. The State Water Board has stated: "one factor to be considered in determining BPTC would be the water quality achieved by other similarly situated dischargers, and the methods used to achieve that water quality." (See Order WQ 2000-07, at pp. 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);

[25] 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."

[26] 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.

comparison of alternative methods of treatment or control, and consideration of methods currently used by the discharger or similarly situated dischargers.[27] The costs of the treatment or control should also be considered. Many of the above considerations are made under the "best efforts" approach described later in this section. In fact, the State Water Board has not distinguished between the level of treatment and control required under BPTC and what can be achieved through "best efforts."

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

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

As described in the Question and Answers Document, factors considered in determining whether degradation of water quality is consistent with maximum benefit to people of the State include economic and social costs, tangible and intangible, of the proposed discharge, as well as the environmental aspects of the proposed discharge, including benefits to be achieved by enhanced pollution controls. 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.

[27] See *Questions and Answers, State Water Resources Control Board, Resolution 68-16* (February 16, 1995).

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 at or exceeding water quality objectives already, it is not a high quality water and is not subject to the requirements of the antidegradation policy. As stated previously, data collected by the Central Valley Water Board, dischargers, educational institutions, and others demonstrate that many water bodies in the Central Valley Region are already impaired for various constituents associated with irrigated agricultural activities.

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, at p. 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.

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 and ground waters in the Eastern San Joaquin River Watershed to construct provisions in this Order to meet the substantive requirements of Resolution 68-16.

This Order regulates discharges from thousands of individual fields to a very large number of water bodies within the Eastern San Joaquin 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 is no comprehensive historic data.[28]

However, data collected by the Central Valley Water Board, dischargers, educational institutions, and others demonstrate that many water bodies within the Eastern San Joaquin 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: ammonia, arsenic, chlorpyrifos, copper, DDE, diazinon, diuron, dissolved oxygen, electrical conductivity, *E. coli*, lead, molybdenum, nitrate, pH, simazine, total dissolved solids, thiobencarb, algae toxicity, sediment toxicity, fathead minnow toxicity, and water flea toxicity. Those same data collection efforts also indicate that 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, 22 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. The groundwater represented by these wells may not be considered "high quality" with respect to nitrates. However, 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."

Baseline Water Quality for Nitrate
In order to conduct an antidegradation analysis, the background quality of the water body must be compared to water quality objectives. As stated above, if the quality of a water body has declined since 1968, the year of adoption of the state antidegradation policy, and that subsequent lowering was not a result of regulatory action consistent with this policy, a baseline representing the historically higher water quality is the appropriate representation of background.

Given the sparsity of historical data from the 1970s and 1980s, as well as the extensive area covered by this Order, any calculation of baseline water quality will be an estimate.

[28]Irrigated lands discharges have been regulated under a conditional waiver since 1982, but comprehensive data as to trends under the waiver are not available.

The CV-SALTS initiative has estimated median nitrate concentrations at various points in time for 22 "initial analysis zones" (IAZs) comprising the Central Valley.[29] For the purposes of this antidegradation analysis, the lowest nitrate concentrations since 1968 provided by CV-SALTS, for the IAZs covered (in whole or in part) by this order, will serve as the baseline water quality.

Comment [1]: Thoughts on using this as baseline? Where's the "2-4 mg/L" we reference in our comment letter? is it in the draft SNMP?

Consistency with BPTC and the "Best Efforts" Approach

Due to the numerous commodities being grown on irrigated agricultural lands and varying geological conditions within the Eastern San Joaquin 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 the Irrigated Lands Program Existing Conditions Report[30] (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 standards combined with upfront evaluation, planning and implementation of management practices to attain those goals, and 2) additional planning and implementation measures where degradation trends are observed ~~that threaten to impair a beneficial use or where beneficial uses are impaired (i.e., water quality objectives are not being met).~~ Taken together, these processes are considered BPTC/best efforts. The planning and implementation processes that growers must follow on their farms should lead to the on-the-ground implementation of the optimal practices and control measures to address waste discharge from irrigated agriculture.

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[29] See, e.g., Central Valley Salinity Alternatives for Long-Term Sustainability, Draft Salt and Nitrate Management Plan, Chapter 6 (January 2016) ("Draft SNMP"). The Draft SNMP also provides a methodology for estimating best water quality since 1968 in Appendix C, pp.18-19.

[30] California Regional Water Quality Control Board, Central Valley Region, and Jones and Stokes. 2008. *Irrigated Lands Regulatory Program Existing Conditions Report.* Sacramento, CA. December 2012 – Revised October 2013 and [Month Year]

1. Farm Management Performance Standards

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 need,
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 their 1995 Questions and Answers, Resolution 68-16: "To evaluate the best practicable treatment or control method, the discharger should compare the proposed method to existing proven technology; evaluate performance data, e.g., through treatability studies; compare alternative methods of treatment or control; and/or consider the method currently used by the discharger or similarly situated dischargers." Available state and federal guidance on management practices may serve as a measure of the types of water quality management goals for irrigated agriculture recommended throughout the state and country (e.g., water quality management goals for similarly situated dischargers). This will provide a measure of whether implementation of the above performance standards will lead to implementation of BPTC/best efforts.

- As part of California's Nonpoint Source Pollution Control Program, the State Water Board, California Coastal Commission, and other state agencies have identified seven management measures to address agricultural nonpoint sources of pollution that affect state waters (*California's Management Measures for Polluted Runoff*, referred to below as "Agriculture Management Measures").[31] 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.

[31] *California's Management Measures for Polluted Runoff* (<http://www.waterboards.ca.gov/water_issues/programs/nps/docs/cammpr/info.pdf>) December 2012 – Revised October 2013 and [Month Year]

- USEPA's National Management Measures to Control Nonpoint Source Pollution from Agriculture (EPA 841-B-03-004, July 2003;),[32] "*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 standard d are consistent with this measure. The Order also requires irrigation and nitrogen management plans to be developed by ~~Members within both high vulnerability and low vulnerability groundwater areas~~. Irrigation and ~~N~~nitrogen management plans require Members to document how their fertilizer use management practices meet performance standard d. Finally, where nutrients are causing exceedances of water quality objectives in surface waters, this Order would require development of a detailed SQMP which would address sources of nutrients and require implementation of practices to manage nutrients. Collectively, these requirements work together in a manner consistent with management measure 3.

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

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.

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

This Order requires development of water quality management plans (surface or groundwater) where degradation trends are observed ~~that threaten to impair a beneficial use or where beneficial uses are impaired (i.e., water quality objectives are not being met).~~ SQMPs/GQMPs include requirements to investigate sources, develop strategies to

implement practices to ensure waste discharges are meeting the Orders 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 Eastern San Joaquin 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 minimizing degradation will be periodically reevaluated as necessary and/or as more recent and detailed water quality data become available. 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.~~

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

In addition to the SQMPs/GQMPs, the Order includes a comprehensive suite of reporting requirements that should provide the board with the information it needs to determine whether the necessary actions are being taken to achieve BPTC and protect water quality, where applicable. ~~In high vulnerability groundwater areas, t~~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~~all 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, t~~The actions required by the MPEP must be implemented as applicable by Members ~~in both high and low vulnerability~~all 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 "core" monitoring sites on a rotating basis. The data gathered from the surface water monitoring effort will allow the board to determine whether there is a trend in degradation of water quality related to discharges from 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 suggests 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~~ may 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 irrigation and nitrogen management plans prepared in accordance with the irrigation and nitrogen management plan templates approved by the Executive Officer. The plans require Members to document how their fertilizer use management practices minimize excess nutrient application relative to crop need. ~~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. Members in high vulnerability areas will need to submit nitrogen management plan summary reports.~~ Through the farm evaluation, the Member must identify "…on-farm management practices implemented to achieve the Order's farm management performance standards." (see Attachment B, section VI.A). In addition, the irrigation and nitrogen management plan summary reports ~~required in high vulnerability areas~~ will include, at a minimum, information on the ratio of total nitrogen ~~available for crop uptake to the estimated crop consumption of~~applied to nitrogen removed via harvest. Irrigation and ~~N~~nitrogen management plans and irrigation and nitrogen management plan summary reports provide indicators as to whether the Member is meeting the performance standard to minimize excess nutrient application relative to

crop need for nitrogen. The MPEP study process would be used to determine whether the ~~nitrogen consumption~~A/R ratio meets the performance standard of the Order.

Summary

Members are required to implement practices to meet the above goals 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 goals as part of farm evaluations and irrigation and nitrogen management plans. Members ~~in high vulnerability areas~~may 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 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 BPTC is achieved, where applicable.

Requirements for individual farm evaluations, irrigation and nitrogen management plans, 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 limited. 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 nitrogen management plan 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.~~

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, based to the extent possible on existing data, 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 limited degradation of existing high quality waters. This limited 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);
- The state and nation depend on Central Valley agriculture for food (PEIR, Appendix A);
- 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 of their water supplies 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 also is designed to detect and address exceedances of water quality objectives, if they occur, in accordance with the compliance time schedules provided therein. Therefore, local communities should not incur any additional treatment costs associated with the limited degradation authorized by this Order; and
- The Order includes performance standards that would work to prevent further degradation of surface and groundwater quality.

[The above maximum benefit evaluation must be completely redone. It should be a separate section that details the amount of authorized degradation and summarizes a proper cost-benefit analysis of this degradation, including the factors listed in our comment letter.]

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The requirements of the Order and the limited 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 limited 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.

California Water Code Sections 13141 and 13241

The total estimated annual cost of compliance with this Order, e.g., summation of costs for administration, monitoring, reporting, tracking, implementation of management practices, is expected to be approximately $4.10 per acre greater than the cost associated with the protection of surface water only under the Coalition Group Conditional Waiver. The total estimated cost of compliance associated with continuation of the previous Coalition Group Conditional Waiver within the Eastern San Joaquin River Watershed is expected to be approximately 96 million dollars per year ($114.45 per acre annually). The total estimated cost of this Order is 99 million dollars per year ($118.55 per acre annually).

Approximately $113.34 of the estimated $118.55 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.[33] 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 $0.56/acre. The combined total estimated costs that include third-party and state fees are estimated to be $4.50 /acre annually or less than 5% of the total estimated cost of $118.55 per acre. There are a 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 Eastern San Joaquin 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, regional surface and groundwater management plans, and regional surface water quality monitoring approach similar to Alternative 2 of the PEIR; farm planning, management practices

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

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 the Order are estimated using the costs for these components of Alternatives 2-5 given in Tables 2-19, 2-20, 2-21, and 2-22 of the *Draft Technical Memorandum Concerning the Economic Analysis of the Irrigated Lands Regulatory Program* (Economics Report).[34] Estimated costs of management practices are based on costs for Alternatives 2 and 4. Table 4 summarizes the major regulatory elements of the Order and provides reference to the PEIR alternative basis.

Table 4. Summary of regulatory elements

Order elements	**Equivalent element from Alternatives 2-5**
Third-party administration	Alternative 2
Farm evaluation Sediment and erosion control plan Irrigation and ~~N~~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
Regional surface water monitoring	Alternative 2 regional surface water monitoring
Regional trend groundwater monitoring	Alternative 4 regional groundwater monitoring
Management practices evaluation program	Alternative 4 regional groundwater monitoring, targeted site-specific studies to evaluate the effects of changes in management practices on groundwater quality and Alternative 5 installation of groundwater monitoring wells at prioritized sites
Management practice reporting	Alternative 4 tracking of practices
Irrigation and ~~N~~nitrogen management plan summary reporting	Alternative 4 nutrient tracking
Management practices implementation	Alternative 2 or 4 costs of 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. Farm evaluation, sediment and erosion control plan and irrigation and nitrogen management planning (farm plans) costs are estimated to be similar to the costs shown for Alternative 4 for farm planning (Table 2-21, Economics Report). 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). Total surface water monitoring and reporting costs are estimated to be similar to the costs shown for Alternative 2 –essentially a continuation of the current regional surface water monitoring approach. Total regional groundwater monitoring and reporting costs are estimated to be similar to the

[34] 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

costs shown for Alternative 4 in Table 2-21 of the Economics Report minus the "Tier 3 individual monitoring." Costs for installation of groundwater monitoring wells are estimated to be similar to the costs shown for Alternative 5 in Table 2-22 of the Economics Report. Tracking costs of management practices and irrigation and nitrogen management plan information are estimated to be similar to the costs shown for Alternative 4 in Table 2-21 of the economics report –under "tracking." Estimated management practices costs are equal under Alternatives 2 and 4. Estimated average annualized costs per acre of the Order relative to full implementation of the current waiver program in the San Joaquin River Watershed (per acre costs are applicable to the Eastern San Joaquin River Watershed) are summarized below in Table 5.

Table 5. Estimated annual average per acre cost of the Order relative to full implementation of the current program (PEIR Alternative 1) in the San Joaquin River Watershed (applicable to the Eastern San Joaquin River Watershed)

	Order	Current program	Change
Administration	0.84	0.77	0.07
Farm plans	0.71	--	0.71
Monitoring/reporting/tracking	3.66	1.18	2.48
Management practices	113.34	112.50	0.84
Total	118.55	114.45	4.10

* Totals may not sum due to rounding. Estimated cost figures are from Tables 2-18, 2-19, 2-20, 2-21, and 2-22 of the Economics Report for the San Joaquin River Watershed. Per acre costs have been developed using the acres in the San Joaquin River Watershed (est. 2,126,028, Table 3-3, Economics Report).
** These costs are an estimate of *potential*, not required costs of implementing specific practices.

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.[35] The estimated total annual cost of this Order of $99 million dollars ($118.55 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 annual cost per acre of Alternative 4 in the San Joaquin River Watershed is $121 (applicable to the Eastern San Joaquin River Watershed). The Order, based substantially on Alternative 4, has a similar cost and is expected to have similar overall economic impacts, as described in the Economics Report.

[35] 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).

California Water Code Section 13263

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

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

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

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

Environmental characteristics of the Eastern San Joaquin 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 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. 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 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[36] 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 Eastern San Joaquin River Watershed. It is estimated that approximately 56 thousand acres of Important Farmland within the Eastern San Joaquin River Watershed potentially would be removed from production under full implementation of the previous conditional waiver program (Conditional Waiver Order R5-2006-0053); it is estimated that an additional 4,100 acres of Important Farmland may be removed from production due to increased regulatory costs of this Order (total of approximately 60 thousand acres, as described in Attachment D of this Order). 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.

(e) The need for developing housing within the region

This Order establishes waste discharge requirements for irrigated lands in the eastern San Joaquin 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

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 Eastern San Joaquin River Watershed.

[36] *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.

Figure 5. Groundwater Protection Areas and Hydrogeologically Vulnerable Areas within the Eastern San Joaquin River Watershed Area.

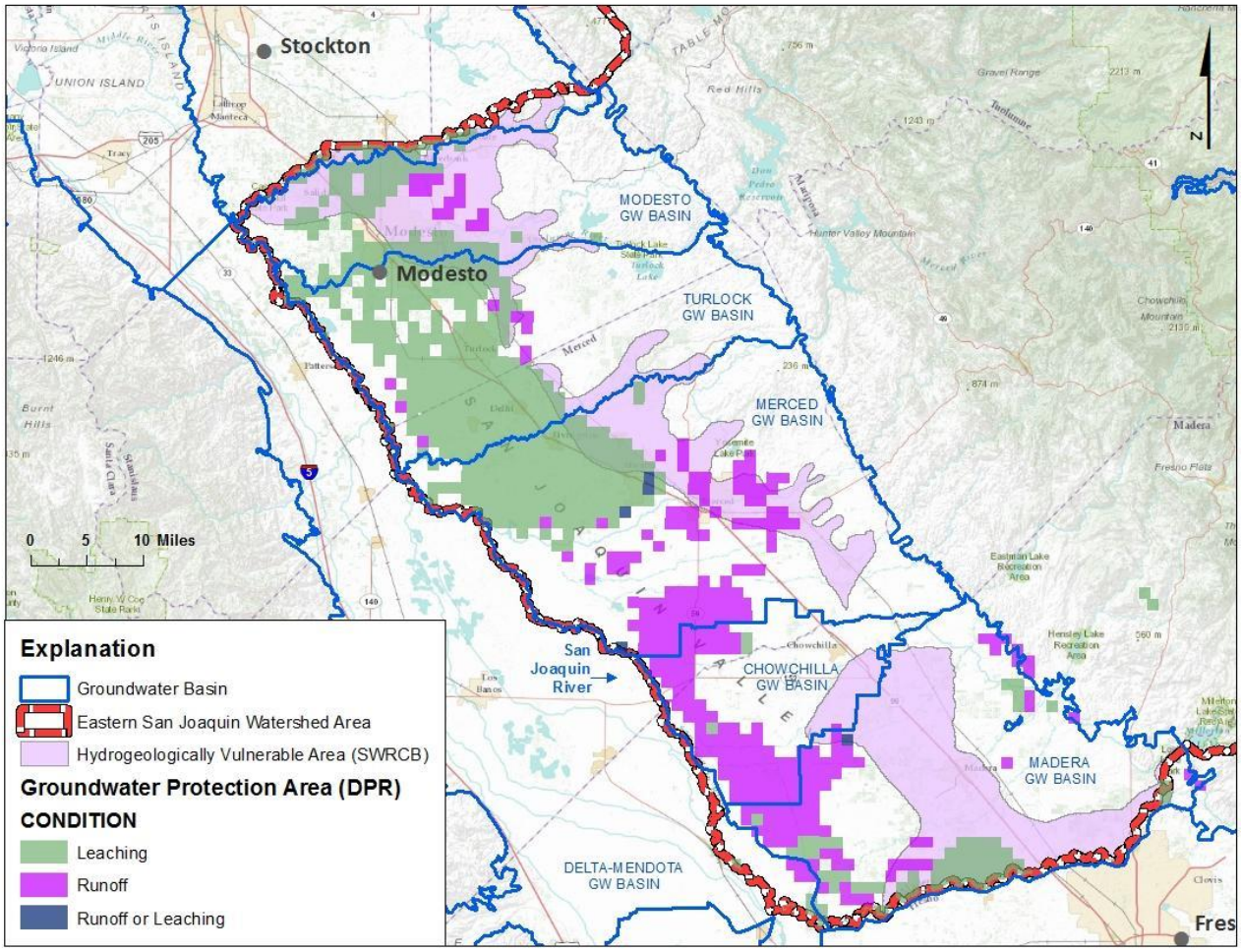
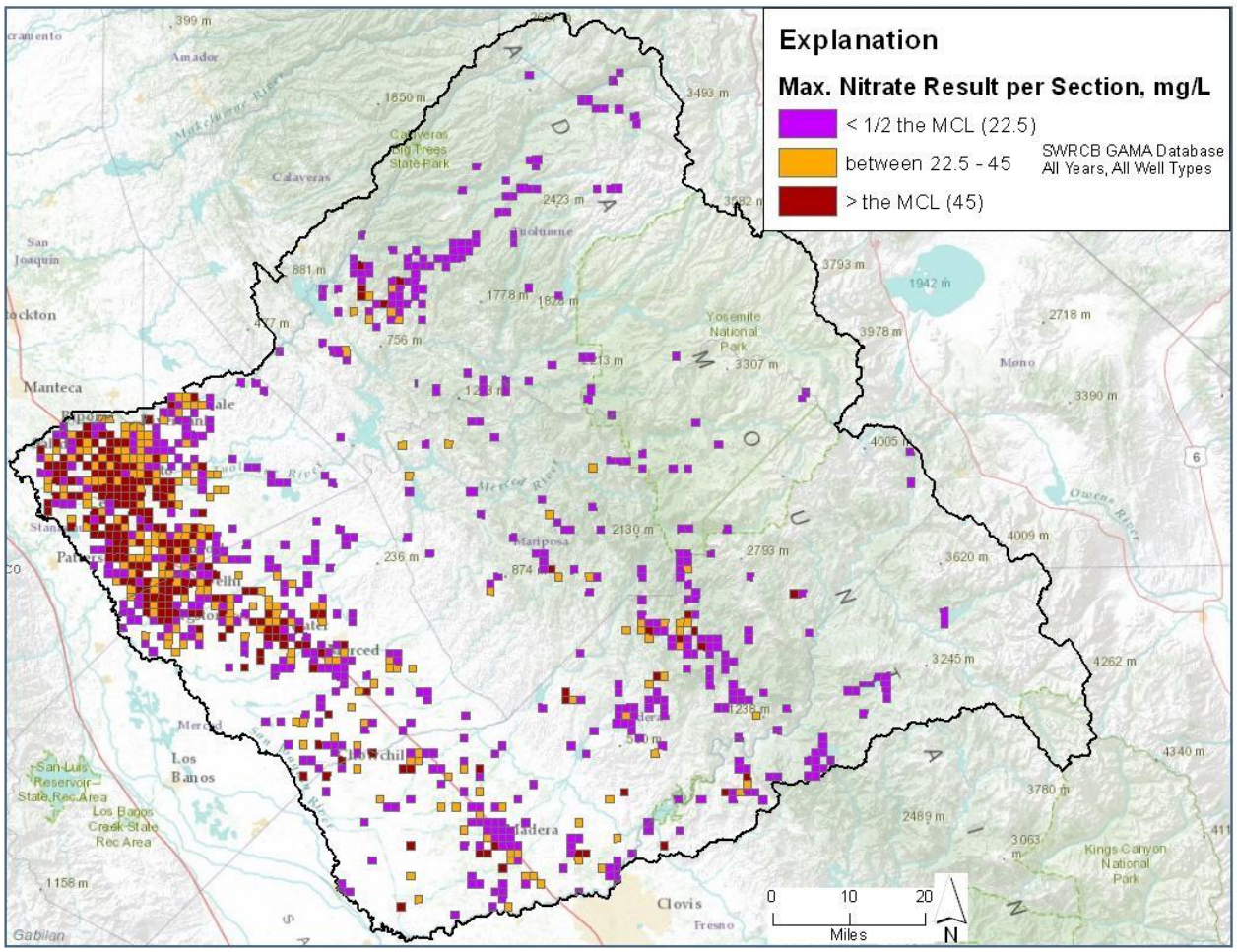


Figure 6. Maximum Nitrate Concentrations per Square Mile Section of Land for Samples with Nitrate Detections. GAMA Database, 1978-2011.



Attachment A
Community Water Center's Well Testing Program

Community Water Center (CWC) provided a free private well testing program over the past year for residents of the Central Valley. The program tested Central Valley residents' domestic private wells to provide them with water quality results. The private well testing program officially sampled 32 private well owners' water quality and also provided educational material about their results and future options. CWC employees completed a 4 hour water quality sampling certification course and followed a strict protocol for all phases of the project from outreach, to water sampling, and to the follow-up visits. CWC also shared data through the Geotracker GAMA website operated by the State Water Resources Control Board.

CWC conducted extensive outreach to private well communities to locate willing participants in the testing program. CWC staff spent about about 10 hours every 3-4 weeks on outreach. (It is worth noting that outreach in a mandatory program is likely to require less time than in a voluntary program like CWC's.) Interested residents were provided with CWC's Private Well Program participation agreement form to ensure they knew exactly what the program was and what we were sampling for (e.coli/total coliform bacteria, nitrates, 1,2,3-trichloropropane, DBCP, arsenic, uranium, hexavalent chromium).

On well testing days, CWC employees spent about an hour preparing sample bottles, sampling materials and measuring devices. CWC Employees used the Hanna HI-991300 pH/Conductivity tester for well purging protocol to ensure samples were being taken from the groundwater source and not from the storage tank, and the EnoScientific Well Sounder Pro 2010 to measure water depth where applicable. On site, CWC employees re-read the participation agreement to residents and then collected the samples. This process lasted 40-60 minutes depending on well purge results and whether a water depth analysis was able to be conducted. After a day of sampling, a lab courier picked up and delivered samples to BC Laboratories in Bakersfield, CA.

Once CWC received the laboratory results, follow-up packets were customized for each participant based on their results. Contaminant fact sheets, a letter of results, drought resource sheets, and other educational materials were tailored for each home in English and Spanish. Creating these follow-up packets took anywhere between an hour or two depending on the size of the sampling group. A follow-up visit was scheduled for each resident to discuss the results and walk through possible next steps. Each visit lasted about 15-30 minutes.

Total staff time required for each well:

- Time for sampling preparation, testing, and well sounding where applicable: 1.5-2 hours.
- Outreach took about twice as long as actual sampling, due to the voluntary nature of our program. It often took us outreaching to 10 homes to secure one participant.
- Follow-up took about twice as long as actual sampling due to the extensive follow-up completed by CWC staff to develop information on immediate and long-term solutions.
- Inputting the data for all wells into GeoTracker GAMA took several hours.
- All of the times do not include travel time which, on average, was an hour round-trip.

Cost for testing: CWC paid $200 (at a 50% discounted rate) to test for 7 contaminants for each well. It is possible that the Coalitions could also negotiate a discounted rate since they will be doing bulk testing.

Exceedances by contaminant for 32 Wells Sampled:

Nitrate: 9 wells over the MCL (plus one test very close to the MCL).
Coliform: 14 wells with positive results.
E.Coli: 3 wells with positive results.
Arsenic: 1 well over the MCL (28 above the PHG).
1,2,3-TCP: 2 above the notification limit, 3 total above the PHG.
Uranium: 31 over the PHG, none over the MCL.
Hexavalent Chromium: 26 over the PHG, none over the MCL.

Sample Date	Field Point	Location	(Well Sounder) ft	Well Drilled Year	Total Coliform cfu/100ml	E.coli cfu/100ml	Nitrate mg/L
MCL					0	0	45
PHG					0	0	45
7.23.15		Monson	126		1	<1	
8.18.15	NTC01	Porterville		2010 OR	6.4	2	180
8.12.15	NTC02	Orosi			290	<1	43
8.18.15	NTC03	Porterville			1	<1	6.3
8.19.15	NTC04	Orosi	136		<1	<1	74
8.19.15	NTC05	Orosi		2006 OR	17	<1	61
9.8.15	NTC06	Orosi	35-40 OR	2005 OR	150	<1	34
9.8.15	NTC07	Orosi		>10 yrs OR	<1	<1	74
9.9.15	NTC08	Yettem			5.2	3.1	35
9.9.15	NTC09	Yettem	65		-	-	16
9.10.15	NTC10	Reedly			2000	330	18
9.10.15	NTC11	Reedly			<1	<1	14
10.7.15	NTC12	Porterville			<1	<1	4.5
10.7.15	NTC13	Porterville			<1	<1	4.4
10.7.15	NTC14	Porterville			>2400	<1	2.3
10.7.15	NTC15	Porterville	185		<1	<1	5.7
10.20.15	SK01	Alameda	192		<1	<1	7
10.20.15	SK02	Alameda	187	2011	<1	<1	15
10.20.15	SK03	Alameda	62		<1	<1	15
11.17.15	NTC16	Orosi			<1	<1	33
11.17.15	NTC17	Yettem	108		<1	<1	200
11.17.15	NTC18	Visalia			<1	<1	31
1.21.16	NTC19	E. Orosi	65		88	<1	98
1.21.16	NTC20	Orosi	70		<1	<1	17
1.21.16	NTC21	E. Orosi	69		<1	<1	72
1.21.16	NTC22	E. Orosi	55		<1	<1	80
2.11.16	NTC23	Porterville			29	<1	26
2.11.16	NTC24	Terra Bella			11	<1	30

3.8.16	NTC27	Visalia		<1	<1	22
3.8.16	NTC28	Visalia	99	<1	<1	6.1
3.8.16	NTC29	Exeter		14	<1	14
3.8.16	NTC30	E.Porterville		>200	<1	63
3.8.16	NTC31	E.Porterville		12	<1	15
3.8.16	EPHH1	E.Porterville		53	<1	31

MCL =Maximum Contaminant Level, PHG = Public Health Goal, NL = Notification Level, OR= Owner Reported

DBCP	1,2,3-TCP	Chromium	Uranium	Arsenic
ug/L	ug/L	ug/L	pCi/L	ug/L
0.2	0.005 (NL)	10.0	20	10
0.0017	0.0007	0.02	0.43	0.004
n/a	0.015 (SHE)	1.0	0.5	5.2
ND	ND	0.27	14	1
ND	ND	0.55	1.3	1.6
ND	ND	ND	2.7	ND
ND	ND	0.54	5	0.88
ND	ND	0.34	7.6	2.2
ND	ND	1.8	1.6	1.9
0.15	0.16	0.54	4.4	1.2
ND	ND	0.34	6.8	3
ND	ND	0.52	4	3.1
ND	ND	0.39	1.6	2.3
ND	ND	0.28	1.8	2.1
ND	ND	n/a*	5.3	ND
ND	ND	n/a*	5.4	ND
ND	ND	n/a*	2.9	1.2
ND	ND	n/a*	4.6	2.1
ND	ND	ND	16	11
ND	ND	0.4	13	8.7
ND	0.0098	0.5	2.3	8.4
ND	ND	0.4	2.6	2.8
ND	ND	0.4	3.3	2.1
ND	ND	0.52	13	0.89
ND	ND	0.27	2.2	1.6
ND	ND	0.16	1.8	2.1
ND	ND	0.52	8.4	1.8
ND	ND	0.48	7.7	2
ND	0.003	0.76	2.5	1.3
ND	ND	0.17	4.1	ND

ND	ND	2.8	0.41	2
ND	ND	0.33	0.72	ND
ND	ND	0.95	0.81	1.8
ND	ND	3	3.7	1.9
ND	ND	ND	2.8	1.2
ND	ND	0.22	3.7	0.82

Quotes for Private Well Testing, CWC, draft 6.30.15

	Method	Moore Twining	BC Labs	BSK Labs
Total Coliform & E. Coli (DW MPN)	SM9223B	25	13	25
Nitrate as NO3	EPA 300.0	10	7	10
1,2,3-TCP Low Level	EPA 504.1 / DHS-1,2,3-TCP	65	70	90
EDB, DBCP	EPA 504.1	45	30	45
Hexavalent Chromium by IC	EPA 218.6	65	40	45
Uranium, Total Alpha by 200.8	varies	25	20	20
Arsenic, Total	EPA 200.8	10	7	15
Sub-total (all 7 contaminants)		***245***	***187***	***250***
Total 30 wells		***7350***	***5610***	***7500***

Geotracker GAMA EDF		$30 per submission	4% of total	TBD
Estimated cost for Geotracker		900	224.4	TBD
Total including Geotracker		**8250**	**5834.4**	**TBD**

Other				
Total Coliform & E. Coli (P/A)	SM9223B	18	11	n/a
Hexavalent Chromium by Coliometric	EPA 7196A	35	30	maybe 45?

List prices for BC Labs

	25	
	15	
	150	
	65	
*Unclear wh	100	*This is the Chrom-6 test with a low detection limit
	25	I could not find the quote for Uranium, but am going to estaimte it for $25
	15	
	395	

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CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
CENTRAL VALLEY REGION

ORDER R5-2012-0116-R4~~3~~
ATTACHMENT B TO ORDER R5-2012-0116-R4~~3~~
MONITORING AND REPORTING PROGRAM

WASTE DISCHARGE REQUIREMENTS GENERAL ORDER
FOR
GROWERS WITHIN THE EASTERN SAN JOAQUIN RIVER WATERSHED
THAT ARE MEMBERS OF THE THIRD-PARTY GROUP

TABLE OF CONTENTS

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 Eastern San Joaquin River Watershed that are Members of the Third-Party Group, Order R5-2012-0116-R4~~3~~ (hereafter referred to as the "Order"). 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 Members are meeting water quality objectives. Additional discussion and rationale for this MRP's requirements are provided in Attachment A of the Order.

This MRP establishes specific surface and ground water monitoring, reporting, and electronic data deliverable requirements for the 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.

II. General Provisions

This Monitoring and Reporting Program (MRP) conforms to the goals of the Non-point Source (NPS) Program as outlined in *The Plan for California's Nonpoint Source Pollution (NSP) 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 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 becomes effective on 7 December 2012. The Central Valley Water Board Executive Officer may revise this MRP as necessary. Upon the effective date of this MRP, the third-party, on behalf of the individual Members, shall implement the following monitoring and reporting.

[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.

III. Surface Water Quality Monitoring Requirements

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 different types of monitoring sites described below: 1) Core sites; 2) Represented sites; and 3) Special Project sites. Core sites are monitored comprehensively on an ongoing basis to track trends in surface water quality and to identify water quality problems. Represented sites generally have characteristics similar to, and are, therefore, represented by the Core sites within their common zone.[2] When a water quality problem is identified at a Core site, the represented sites are evaluated and potentially monitored to determine whether the water quality problem is also occurring at the Represented site (some represented water bodies may not have a monitoring site, e.g. in cases when there is no access). Special Project sites are identified and monitored to investigate identified water quality problems. A Core site or Represented site may also be a Special Project site.

1. Core Site Monitoring

At a minimum, surface water monitoring (as described in section III.C.1) within each zone shall be conducted at one of the designated Core sites (see Table 1) for two consecutive years, followed by two years of monitoring at the second Core monitoring site. Core site monitoring shall alternate continuously between the two Core sites. When a water quality objective or trigger limit at a monitored Core site is exceeded, the parameter associated with the exceedance must be monitored for a third consecutive year.[3]

2. Represented Site Monitoring

When a water quality objective or trigger limit is exceeded at a Core site, the third-party must evaluate the potential for similar risks or threats to water quality associated with that parameter at the sites represented by the Core site (Represented sites). The evaluation must be included in the Monitoring Report (see section V below). If pesticide use information or other factors indicate a risk, monitoring for that parameter must be performed in the appropriate Represented water bodies. The proposed monitoring plan must be included in the Monitoring Plan Update (see section III.C below). Any such monitoring must occur for a minimum of two years during the time period of highest risk of exceedance of water quality objectives for that parameter. When a water quality objective at a monitored

[2] As part of their 25 August 2008 Monitoring and Reporting Program Plan (2008 MRPP), the East San Joaquin Water Quality Coalition (the Coalition) designated six zones within its area based on hydrology, crop types, land use, soil types, and rainfall. The zones identified in the 2008 MRPP are the same zones as those identified in Table 1.

[3] If two exceedances have occurred within the two years the Core 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.

Represented site is exceeded, the parameter associated with the exceedance must be monitored for a third consecutive year.[4]

Any watershed area that does not contain a monitoring site due to issues of access or location downstream of urban influence must be represented by the Core sites in that zone. Any applicable surface water quality management plan (SQMP) actions associated with the Core site must take place in these watershed areas (represented drainages without monitoring sites).

3. Special Project Sites

In addition to Core and Represented sites, the third-party may designate 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,[5] or to evaluate sources of identified water quality problems.

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). Core sites and Represented 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).

B. Monitoring Locations

The location of Core and monitored Represented sites are identified in Table 1 below. The third-party may submit written requests (including technical justification) for removal/addition of monitoring sites for approval by the Executive Officer.

Table 1. Third-party Core and Monitored Represented* Sites By Zone

ID	Zone	Site Type	Site Name	Station Code	Latitude	Longitude
B	1	Core	Dry Creek @ Wellsford Rd	535XDCAWR	37.6602	-120.8743
	1	Core	TBD[6]			
F	2	Core	Prairie Flower Drain @ Crows Landing Rd	535XPFDCL	37.4422	-121.0024
	2	Core	TBD			
D	3	Core	Highline Canal @ Hwy 99	535XHCHNN	37.4153	-120.7557
	3	Core	TBD			
E	4	Core	Merced River @ Santa Fe	535XMRSFD	37.4271	-120.6721
	4	Core	TBD			
C	5	Core	Duck Slough @ Gurr Rd	535XDSAGR	37.2142	-120.5596
	5	Core	TBD			
A	6	Core	Cottonwood Creek @ Rd 20	545XCCART	36.8686	-120.1818
	6	Core	TBD			
1	6	Represented	Ash Slough @ Ave 21	545XASAAT	37.05450	-120.41580
2	4	Represented	Bear Creek @ Kibby Rd	535XBCAKR	37.31280	-120.41380
3	6	Represented	Berenda Slough along Ave 18 1/2	545XBSAAE	37.01820	-120.32650
4	4	Represented	Black Rascal Creek @ Yosemite Rd	535BRCAYR	37.33210	-120.39470
6	4	Represented	Canal Creek @ West Bellevue Rd	535CCAWBR	37.36075	-120.54941
7	5	Represented	Deadman Creek @ Gurr Rd	535XDCAGR	37.19360	-120.56120
8	5	Represented	Deadman Creek @ Hwy 59	535DMCAHF	37.19810	-120.48690
9	6	Represented	Dry Creek @ Rd 18	545XDCARE	36.98180	-120.21950

[4] If two exceedances have occurred within the two years the Represented 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.
[5] "Water quality problem" is defined in Attachment E.
[6] "To be determined" (TBD) monitoring sites will be established by the third-party and the Water Board.

11	2	Represented	Hatch Drain @ Tuolumne Rd	535XHDATR	37.51490	-121.01220
12	3	Represented	Highline Canal @ Lombardy Ave	535XHCHNN	37.45560	-120.72070
13	2	Represented	Hilmar Drain @ Central Ave	535XHDACA	37.39060	-120.95820
14	4	Represented	Howard Lateral @ Hwy 140	535XHLAHO	37.30790	-120.78200
15	2	Represented	Lateral 2 1/2 near Keyes Rd	535LTHNKR	37.54780	-121.09274
16	2	Represented	Lateral 5 1/2 @ South Blaker Rd	535LFHASB	37.45823	-120.96726
17	2	Represented	Lateral 6 and 7 @ Central Ave	535LSSACA	37.39779	-120.95971
18	2	Represented	Levee Drain @ Carpenter Rd	535XLDACR	37.47903	-121.03012
19	4	Represented	Livingston Drain @ Robin Ave	535XLDARA	37.31690	-120.74230
20	2	Represented	Lower Stevinson @ Faith Home Rd	535LSAFHR	37.37238	-120.92318
21	4	Represented	McCoy Lateral @ Hwy 140	535XMLAHO	37.30945	-120.78759
22	5	Represented	Miles Creek @ Reilly Rd	535XMCARR	37.25820	-120.47550
35	1	Represented	Mootz Drain Downstream of Langworth Pond	535XMDDLP	37.70551	-120.89438
24	3	Represented	Mustang Creek @ East Ave	535XMCAEA	37.49180	-120.68390
26	1	Represented	Rodden Creek @ Rodden Rd	535XRCARD	37.79042	-120.80790
30	2	Represented	Unnamed Drain @ Hogin Rd	535XUDAHR	37.43129	-120.99380
31	4	Represented	Unnamed Drain @ Hwy 140	535XUDAHO	37.31331	-120.89217
33	2	Represented	Westport Drain @ Vivian Rd	535WDAVR	37.53682	-121.04861

*Monitored Represented sites in the table are not an exhaustive list; the Executive Officer may require the third-party to add monitoring sites for represented water bodies as necessary to meet the requirements of the Order.

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 and to determine whether existing or newly implemented management practices comply with the receiving water limitations of the Order. Surface water 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 Eastern San Joaquin Watershed are causing or contributing to any surface water quality problems.

Surface water assessment monitoring shall be conducted at Core sites and shall consist of the general water quality parameters, nutrients, pathogen indicators, water column and sediment toxicity, pesticides, and metals identified in section III.C.3. 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).[7] The third-party shall continue monitoring as described in the Coalition's 25 August 2008 Monitoring and Reporting Program Plan (2008 MRPP) until the Executive Officer has approved the Monitoring Plan Update. If the there are no proposed or required changes to the previous Monitoring Program Plan or Monitoring Plan Update, the third-party is not required to submit the Monitoring Plan Update.

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 Core or Represented site during non-scheduled years. Parameters of concern may include, but are not limited to, parameters that exceed an applicable water quality objective or water quality trigger (see section VIII).

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.

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

The third-party shall identify storm runoff monitoring criteria that are based on precipitation levels and knowledge of soils or other factors affecting when storm runoff is expected to occur at monitoring sites. The collection of storm runoff samples shall not be contingent upon the timing of other sampling events and could result in monitoring more than once during a month.

2. Monitoring Schedule and Frequency

The third-party shall identify the appropriate monitoring periods (e.g., months, seasons) for all 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 Core and Represented 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. 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 management practice implementation. Water quality is evaluated with both field-measured parameters and laboratory analytical data as listed on Table 2 of this MRP. The pesticides identified as "to be determined" (TBD) on Table 2 shall be identified as part of a process that includes input from qualified scientists and coordination with the Department of Pesticide Regulation. Based on this process, the Executive Officer will provide the third-party with a list of pesticides that require monitoring in areas where they are applied and have the potential to impair water quality.

Parameters that are part of an adopted TMDL that is in effect and for which irrigated agriculture is a source within the Eastern San Joaquin 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 Eastern San Joaquin River Watershed for which irrigated agriculture is a source include the San Joaquin River Deep Water Ship Channel dissolved oxygen; San Joaquin River salt, boron, selenium, diazinon, and chlorpyrifos.

The metals to be monitored at sites within each site 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 warrant monitoring for each site 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., approved MRPP, or previously approved Monitoring Plan Update), the third-party is not required to submit the 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
Gen Phys	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 determined according to the process identified in section III.C.3.	Water	TBD
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 Eastern San Joaquin 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	x
	Grain Size	Sediment	x

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

4. Toxicity Testing

The purpose of 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*, *Pimephales promelas*, and *Selenastrum capricornutum* in the water column. Testing for *C. dubia* and *P. promelas* shall follow the USEPA acute toxicity testing methods.[8] Testing for *S. capricornutum* shall follow the USEPA short-term chronic toxicity testing methods.[9] 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[10] 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)

[8] 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.
[9] 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.
[10] 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.

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 solutions, as defined in the freshwater toxicity testing manual.

Selanastrum capricornutum Pre-Test Treatment

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

b. 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* shall be conducted at each monitoring location established by the third-party for water quality 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, with one sample collected between 15 August and 15 October, and one sample collected between 1 March and 30 April, during each year of monitoring. The *H. azteca* sediment toxicity test endpoint is survival. The Executive Officer may request different sediment sample collection timing and frequency under a SQMP.

All sediment samples must be analyzed for total organic carbon (TOC) and grain size. Analysis for TOC is necessary to evaluate the expected magnitude of toxicity to the test species. 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 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 PUR data 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 follow up with a sediment TIE when there is ≥ 50% reduction in test organism survival as compared to the laboratory control. Sediment TIEs are an optional tool.

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). The studies shall be representative of the effects of changes in management practices for the parameters of concern. Once Special Project Monitoring is required, the third-party must submit a Special Project Monitoring proposal. The proposal must provide the justification for the proposed study design, specifically identifying how the study design will quantify 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 pollutants 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.

D. Surface Water Data Management Requirements

All surface water field and laboratory data must be uploaded into the Central Valley Regional Data Center (CV RDC) database and will be exported to the California Environmental Data Exchange Network (CEDEN) once data have been approved as CEDEN comparable. The third-party will input its data into a replica of the CV RDC database following CV RDC and CEDEN business and formatting rules.

The third-party shall utilize the most current version of the database and update associated lookup lists on a routine basis. The third-party shall ensure that the data loaded meet the formatting and business rules as detailed in the most current version of the document "Format and Business Rules for the CV RDC CEDEN Comparable Database."

The Central Valley Water Board has developed several tools to assist the third-party with processing and loading of its data. These tools, whether required or optional, will help the third-party to efficiently conduct data processing and loading and meet data management requirements.

CEDEN Comparable Field Sheets (Required)

The third-party shall use CEDEN comparable field sheets when entering data. An example CEDEN comparable field sheet can be found on the CV RDC 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. Modified versions of the field sheet may be submitted to the Central Valley Water Board Executive Officer for approval.

Format Quick Guide (Optional Tool)

The Format Quick Guide is a guidance document for the formatting of data tailored specifically for the third-party. It contains a column by column guide for filling out the CV RDC data templates with the applicable required codes. The Central Valley Water Board CV RDC will provide this document, and updates to it, upon request based on an approved monitoring plan and associated QAPP.

EDD Checklist (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. An updated checklist will be made available on the CV RDC website.

Online Data Checker (Optional Tool)

An online data checker was developed to automate the checking of the datasets against the current format requirements and business rules associated with CEDEN comparable data. The data checker can be accessed on the CV RDC webpage. Please note that data submission will not be accepted through this tool; however, the checker can still be used to check data for errors.

Electronic Quality Assurance Program Plan (eQAPP) (Required)

The third-party shall use an eQAPP when collecting and analyzing monitoring data. The eQAPP is a spreadsheet document containing the quality control requirements for each analyte and method as detailed in the most current version of the third-party's approved QAPP. Each analyte, method, extraction, units, recovery limits, QA sample requirement, etc. is included in this document using the appropriate codes required for the CEDEN comparable database. The third-party shall use the document to format the reported data and conduct a quality control review prior to loading. Data that do not meet the project quality assurance acceptance requirements must be flagged accordingly and must include brief notes detailing the problem within the provided comments field. Included in this file are also the most recent CEDEN comparable station name and code list as well as the applicable project CEDEN codes for retrieving data from the CEDEN website once data arrive there.

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 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 Assessment Report, 2(3) Management Practices Evaluation Program, and 3(4) Groundwater Quality Trend Monitoring Program.

1. Drinking Water Supply Well Monitoring is designed to identify human health impacts of nitrate contamination and notifying well users of any well contaminations of nitrate above the Maximum Contaminant Level (MCL) for drinking water wells located on agricultural property.

1.2. 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.

2.3. The overall goal of the Management Practice Evaluation Program (MPEP) is to evaluate the effectiveness of management practices in limiting determine the effects, if any, irrigated agricultural practices have on first-encountered groundwater under different conditions that could affect 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).

3.4. 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

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. By December 31, 2016, Members must initiate sampling of private drinking water supply wells located on their property.
2. Members must either (1) conduct two rounds of initial drinking water supply well monitoring during the first year, or (2) submit existing drinking water supply well sampling data, provided sampling and testing for nitrates was completed using EPA approved methods at least twice within the last 5 years. Initial rounds of drinking water supply well sampling shall be conducted once during the fall (September-December) and once during the spring (March-June), and every five years, thereafter, if the nitrate concentration is below 8 mg/L nitrate+nitrite as N. If any drinking water supply wells have a nitrate concentration equal to or above 8 mg/L nitrate+nitrite as N, a repeat sample must be taken within 12 months, and must be sampled annually thereafter unless an alternative sampling schedule based on trending data for the well is approved by the Executive Officer. All further sampling shall be conducted during the quarter when nitrate concentration was at its maximum, based on initial monitoring. Sampling may cease if a drinking water well is taken out of service and no longer provides drinking water.
3. 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.

4. 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.
5. The results of drinking water supply well monitoring are to be included in the third-party's Monitoring Report. All drinking water supply well monitoring data are to be submitted electronically to the State Water Board's GeoTracker Database and to the Central Valley Water Board.
6. If groundwater monitoring determines that water in any well that is used for or may be used for drinking water exceeds 10 mg/L of nitrate+nitrite as N, the Member or third-party must provide notice to the Central Valley Water Board within 24 hours of learning of the exceedance. For wells on a Member's property, the Central Valley Water Board will require that the Member notify the users within 10 days. Where the Member is not the property owner, the Central Valley Water Board will notify the users promptly.

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.

1. *Objectives.* The main objectives of the GAR are to:
   - Provide an 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.
   - Provide a basis for priorities for implementation of ~~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.
   - Information regarding depth to groundwater, provided as a contour map(s).
   - Groundwater recharge information, including identification of areas contributing recharge to urban and rural communities where groundwater serves as a significant source of supply.
   - Soil survey information, including significant areas of high salinity, alkalinity and acidity.
   - Shallow groundwater constituent concentrations (potential constituents of concern include any material applied as part of the agricultural operation, including constituents in irrigation supply water [e.g., pesticides, fertilizers, soil amendments, etc.] that could impact beneficial uses or cause degradation).
   - Information on existing groundwater data collection and analysis efforts relevant to this Order (e.g., Department of Pesticide Regulation [DPR] United States Geological Survey [USGS] State Water Board Groundwater Ambient Monitoring and Assessment [GAMA], California Department of Public Health, local groundwater management plans, etc.). This groundwater data compilation and review shall include readily accessible information relative to the Order on existing monitoring well networks, individual well details, and monitored parameters. For existing monitoring networks

(or portions thereof) and/or relevant data sets, the 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.
   - The GAR shall dDiscuss 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 may 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 or 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 (irrigation method, crop type, nitrogen application and removal rates, etc.). The third-party shall provide the rationale for any 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 default high/low vulnerability groundwater areas using 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 exeedance.

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:
   - Identification of areas previously designated as high vulnerability.
   - 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 urban and rural communities 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 may also be considered in designating and prioritizing vulnerability areas to comply with the requirements of this Order for groundwater. Such data includes, but is not limited to, 1) those areas that have been identified by the State Water Board as Hydrogeologically Vulnerable Areas, 2) California Department of Pesticide Regulation groundwater protection areas, and 3) areas with exceedances of water quality objectives for which irrigated agriculture waste discharges may cause or contribute to the exceedance.

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 areasprioritization associated with approval of the Groundwater Quality Assessment Report.

BC. Management Practice Evaluation Program

The goal of the Management Practice Evaluation Program (MPEP) is to determine evaluate the effectiveness, if any of, irrigated agricultural practices[11] have with regard toon groundwater quality. A MPEP is required 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.D 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:
   - Identify whether existing site-specific and/or commodity-specific management practices are protective of groundwater quality within high vulnerability groundwater areas,
   - Determine if newly implemented management practices are improving or may result in improving groundwater quality.
   - Develop an estimate of the effect of Members' discharges of constituents of concern on groundwater quality in high vulnerability areas. A mass balance and conceptual model of the transport, storage, and degradation/chemical transformation mechanisms for the constituents of concern, or equivalent method approved by the Executive Officer, must be provided.
   - Utilize the results of evaluated management practices to improve the determine whether practices implemented at on represented Member farms (i.e., those not specifically evaluated, but having similar site conditions), need to be improved.

   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 high vulnerability areas and commodities, and present a phased approach to implement the MPEP.

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) of the high vulnerability areas (or commodities within these areas) to be examined under the MPEP

[11] 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.

shall be prepared and submitted to the Executive Officer as detailed in the Management Practices Evaluation Program Workplan section IV.D 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 Monitoring Report. The report shall include all data[12] (including analytical reports) collected by each phase of the MPEP since the previous report was submitted. The report shall also contain a tabulated summary of data collected to date by the MPEP. The report shall summarize the activities conducted under the MPEP, and identify the number and location of installed monitoring wells relative to each other and other types of monitoring devices. Within each report, the 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 and engineering principles to identify management practices protective of groundwater quality.

   The report shall include an assessment of each management practice to determine which management practices are protective of groundwater quality. If monitoring concludes that management practices currently in use are not protective of groundwater quality based upon information contained in the MPER, and therefore are not confirmed to be sufficient to ensure compliance with the groundwater receiving water limitations of the Order, the 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 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.

~~C~~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.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 trend monitoring requirements.

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.

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

2. *Implementation.* To reach the stated objectives for the Groundwater Quality Trend Monitoring program, the third-party shall develop a groundwater monitoring network that will (1) be implemented over ~~both high and low vulnerability~~all 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 monitoring, while still yielding data which can be compared with historical and future data to evaluate long-term groundwater 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 shall submit a proposed Trend Groundwater Monitoring Workplan described in section IV.E 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.

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 monitoring data are to be submitted electronically to the State Water Board's GeoTracker Database and to the Central Valley Water Board.

   Following collection of sufficient data (sufficiency to be determined by the method of analysis proposed by the third-party) 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 in the Trend Groundwater Monitoring Workplan described in section IV.E below.

~~D~~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~~situated throughout the high vulnerability groundwater area(s), and~~ It must also encompass~~ing~~ 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.B 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 proposed approach may include:

   - groundwater monitoring,
   - modeling,
   - vadose zone sampling, or
   - other scientifically sound and technically justifiable methods for meeting the objectives of the Management Practices Evaluation Program.

   Where available, ~~Sufficient~~shallow[13] groundwater monitoring data should be collected ~~or available~~ to ~~confirm or~~ validate the conclusions regarding the effect on groundwater quality of the evaluated practices~~ on groundwater quality~~. 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 the area from which water entering a well originates than deeper wells and allows~~ identification of changes in groundwater quality from activities on the surface at the earliest possible time.

[13] Shallow groundwater in this context refers to groundwater located less than 10 feet below the soil surface, which will exhibit a rapid response to deep percolation (below the root zone) water and nitrate flows.

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., groundwater quality or vadose zone monitoring; soil sampling) for each constituent.

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

3. *Workplan implementation and analysis.* The proposed Management Practices Evaluation Workplan shall contain sufficient information/justification for the Executive Officer to evaluate the ability of the evaluation program to identify whether existing management practices in combination with site conditions, are protective of groundwater quality. The workplan must explain how data collected at evaluated farms will be used to assess potential impacts to groundwater at represented farms that are not part of the Management Practices Evaluation Program's network. This information is needed to demonstrate whether data collected will allow identification of management practices that are protective of water quality at Member farms, including represented farms (i.e., farms for which on-site evaluation of practices is not conducted).

4. *Master workplan –prioritization.* If the third-party chooses to rank or prioritize ~~its high vulnerability~~ 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.

~~E~~F. Trend Monitoring Workplan

The third-party shall develop a workplan for conducting trend monitoring within its boundaries that meets the objectives and minimum requirements described in section IV.C of this MRP. The workplan shall be submitted to the Executive Officer for review and approval. The Trend Monitoring Workplan shall provide information/details regarding the following topics:

1. *Workplan approach.* The Trend Monitoring workplan must include ~~A~~a discussion of the rationale for the number of proposed wells to be monitored and their locations. 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~~ 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.* 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.* Proposed method(s) to be used to evaluate trends in the groundwater monitoring data over time.

Table 3: Trend Monitoring Constituents

Annual Monitoring Conductivity (at 25 °C)* (µmhos/cm) pH* in pH units Dissolved oxygen (DO)* (mg/L) Temperature* (°C) 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.

A. Quarterly Submittals of Surface Water Monitoring Results

Each quarter, the third-party shall submit the previous quarter's surface water monitoring results in an electronic format. The deadlines for these submittals are 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.
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, including drinking water supply well 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 Farm Evaluations

By ~~1~~the end of the first year after the adoption of this permit, ~~May 2017~~9 and annually thereafter, the third-party shall submit the prior year's Farm Evaluation, as described in Section VI.A below, in pdf format. Once the third-party is notified by the Central Valley Water Board that the State Water Board GeoTracker database is available for uploading Farm Evaluation data, the third-party shall submit the Farm Evaluation data solely by uploading into GeoTracker. 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. Once the GeoTracker database is available, any data not loaded into the GeoTracker database shall be noted with the submittal. The third-party shall maintain an original electronic copy of all Farm Evaluations.

D. Annual Irrigation and Nitrogen Management Plan Summary Report Data

By the end of the first year after the adoption of this permit, ~~1 May 2017~~9 and annually thereafter, the third-party shall submit the prior year's Irrigation and Nitrogen Management Plan (INMP) Summary Reports in pdf format. Additionally, by 1 May, the third-party shall create and submit an electronic database table containing the individual data values reported from all of the INMP Summary Reports. Once the third-party is notified by the Central Valley Water Board that the State Water Board GeoTracker database is available for uploading INMP Summary Report information, the third-party shall upload the INMP Summary Reports and individual data values into GeoTracker. 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. Once the GeoTracker database is available, any data not loaded into the GeoTracker database shall be noted with the submittal. 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.

E. Monitoring Report

The Monitoring Report shall be submitted by 1 May every year, with the first report due 1 May 2014. 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 ~~[the monitoring report components for the first report does not include Report Component (18), which shall be due by 1 July 2014]~~:

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 Monitoring Report;
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, and water quality management plan milestones, where applicable;
11. Sampling and analytical methods used;
12. 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);
13. Specification of the method(s) used to obtain estimated flow at each surface water monitoring site during each monitoring event;
14. Summary of exceedances of water quality objectives/trigger limits occurring during the reporting period and for surface water related pesticide use information;
15. Actions taken to address water quality exceedances that have occurred, including but not limited to, revised or additional management practices implemented;
16. Evaluation of monitoring data to identify spatial trends and patterns;
17. Summary of Drinking Water Supple Well Monitoring;
~~16.~~18. INMP Summary Report Evaluation ~~Summary of Nitrogen Management Plan information submitted to the third-party~~;
~~17.~~19. Summary of management practice information collected as part of Farm Evaluations;
~~18.~~20. Summary of mitigation monitoring;
~~19.~~21. Summary of education and outreach activities;
~~20.~~22. Conclusions and recommendations.

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

Report Component (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 (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. The source and date of all data layers must be identified on the map(s). All data layers/shapefiles/geodatabases included in the map shall be submitted with the Monitoring Report.

Report Component (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 (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.

Report Component (12) — 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 (14) — Summary of Exceedances

A summary of the exceedances of water quality objectives or triggers that have occurred during the monitoring period is required in the Monitoring Report. 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 (16) — Evaluation of Monitoring Data

The third-party must evaluate its monitoring data in the Monitoring Report in order to identify potential trends 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 are needed. If deficiencies are identified, the third-party must propose a schedule for additional monitoring or source studies. Upon notification from the Executive Officer, the third-party must monitor any parameter in a watershed 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 (17) – Summary of Drinking Water Supply Well Monitoring

The third-party must summarize the results of drinking water supply well monitoring which shall, at a minimum, include the number of drinking water supply wells tested, the number of notifications of exceedances, any locational trends associated with exceedance notifications, and any trends of increasing or decreasing concentrations in drinking water supply wells.

Report Component (18) – INMP Summary Report Evaluation

In addition to submitting the INMP Summary Reports, 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 total Nitrogen Applied to Nitrogen Removed[14] and the difference between Nitrogen Appliedex~~e~~ and Nitrogen Removed for crops in the Eastern San Joaquin River Watershed. Total Nitrogen Applied includes nitrogen from any sources, including, but not limited to, organic amendments, synthetic fertilizers, and irrigation water.Nitrogen Appliedex is total nitrogen minus nitrogen added from irrigation water Nitrogen Removed includes nitrogen removal via harvest and nitrogen sequestered in permanent wood of perennial crops.

The third-party shall review each Members' INMP Summary Reports and independently calculate and report both the A/R ratio and the Aex-R difference for the current reporting cycle (A/R1 year and
A-R1 year). 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 Aex-R difference (A/R3 year and Aex-R3 year). The formulas for the A/R ratios and Aex-R differences are shown in the equations below.

Aex-$R_{1\ year}$ Difference = [illegible] ((~~[illegible] + [illegible]~~)[illegible]) − [illegible] ([illegible])

Aex-$R_{3\ year}$ Difference = [[illegible] ((Nsynthetic + Norganic) [illegible])]

− [[illegible] ([illegible])]

= ([illegible]) − ([illegible])

Where n = current reporting cycle

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, and further evaluated within each crop type comparing the irrigation method, the soil conditions, and the farming operation size. The third-party shall evaluate the corresponding A-$R_{1\ year}$ and Aex-$R_{3\ year}$ differences by crop type. The third-party shall also evaluate any other A/R ratio or Aex-R difference comparisons as directed by the Executive Officer. For each comparison, the third-party must identify the mean and the standard deviation. A box and whisker plot comparing the A/R ratio and Aex-R difference for each comparison, or equivalent tabular or graphical presentation of the data approved by the Executive Officer, may 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 regulatory target

The third-party must report to the Central Valley Water Board any fields that report A/$R_{3\ year}$ ratios greater than one standard deviation of the mean and notify the Members associated with those fields. The third-party must also report to the Central Valley Water Board what actions have been taken to address fields previously identified to have reported A/$R_{3\ year}$ ratios greater than one standard deviation of the mean.

~~The third-party shall aggregate information from Members' Nitrogen Management Plan Summary Reports to characterize the input, uptake, and loss of nitrogen fertilizer~~

[14] 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.

~~applications by specific crops in the Eastern San Joaquin River Watershed. The third-party's assessment of Nitrogen Management Plan information must include, at a minimum, comparisons of farms with the same crops, similar soil conditions, and similar practices (e.g., irrigation management). At a minimum, the statistical summary of nitrogen consumption ratios by crop or other equivalent reporting units and the estimated crop nitrogen needs for the different crop types and soil conditions will describe the range, percentiles (10^{th}, 25^{th}, 50^{th}, 75^{th}, 90^{th}) and any outliers. A box and whisker plot or equivalent tabular or graphical presentation of the data approved by the Executive Officer may be used. The nitrogen consumption ratio is the ratio of total nitrogen available for crop uptake (from sources including, but not limited to, fertilizers, manures, composts, nitrates in irrigation supply water and soil) to the estimated crop consumption of nitrogen. The summary of nitrogen management 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. The third-party will also provide an aggregate of the data submitted by their Members in an electronic format, compatible with ArcGIS, identified to at least the township level.[15]~~

Report Component (~~18~~19) – Summary of Management Practice Information
The third-party will ~~aggregate and~~ summarize information collected from Farm Evaluations.[16] 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. In addition to summarizing and aggregating the information collected, the third-party will provide the individual data records used to develop this summary in an electronic format, compatible with ArcGIS~~, identified to at least the township level~~.[15] ~~For management practice information provided in Farm Evaluations by Members in their 1 May 2014 submittal to the third-party [per section VII.B.2. of the Waste Discharge Requirements], this Report Component must be submitted to the Central Valley Water Board as an addendum to the Monitoring Report by 1 July 2014.~~

Report Component (~~19~~20) – 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.E 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.

~~D~~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.

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[15] ~~The Member and their associated parcel need not be identified.~~

[16] 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.

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. For toxicity exceedances, the investigation 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.

VI. ~~Group Option -~~ Templates – Third Party and Group Options

The Order provides the option for the third-party to develop templates as an alternative to templates provided by the Central Valley Water Board's Executive Officer. This section describes the minimum requirements that must be met prior to approval of those templates.

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

A. Farm Evaluation Template

A Farm Evaluation Template meeting the requirements above is provided for use in Appendix MRP-3. Should the third-party choose to develop ~~the~~ a Farm Evaluation Template per the Third-Party or Group Option outlined in section VIII.C.1 of the Order, the following provisions apply.

The third-party ~~must~~ may develop a template or web-based information system to gather Farm Evaluation information from Members for each parcel enrolled. The goal of the template is to gather information on general site conditions and Member management practices in place to protect water quality. At a minimum, the template must be designed to collect the following information.

- Identification of the crops grown and acreage of each crop.
- Location of the farm.
- Identification of on-farm management practices implemented to achieve the Order's farm management performance standards. Specifically track which management practices recommended in management plans have been implemented at the farm. On-farm management practices should include:
    - Pest management application practices
    - Irrigation method(s) and irrigation management practices
    - Nitrogen management practices
    - Sediment and erosion control practices
- Identification of whether or not there is movement of soil during storm events and/or during irrigation drainage events (sediment and erosion risk areas) and a description of where this occurs.
- Identification of whether or not water leaves the property and is conveyed downstream and a description of where this occurs.
- Identification of whether or not one or more of the fields managed by the Member have been identified as having an $A/R_{3\ year}$ ratio greater than the average for similar fields.
- Identification of whether or not one or more of the fields managed by the Member are in an area requiring a SQMP or GQMP.
- Identification of how the Member has their Irrigation and Nitrogen Management Plan certified.
- Location of in-service wells and abandoned wells. Identification of whether wellhead protection and backflow prevention practices have been implemented.

As part of its submittal for approval, the third-party must identify the entities that participated in the development of ~~the~~ any proposed Farm Evaluation Template.

B. Irrigation and Nitrogen Management Plan (INMP) and INMP Summary Report Templates

An Irrigation and Nitrogen Management Plan (INMP) Template and INMP Summary Report meeting the requirements below is provided for use in Appendix MRP-4. Should the third-party choose to develop ~~the~~ a Nitrogen Management Plan Template per the Third-Party or Group Option outlined in section VIII.C.2 of the Order, the following provisions apply.

The third-party may develop a template or web-based information system to gather Irrigation and Nitrogen Management Plan and Summary Report information from Members for each parcel enrolled. The goal of the template is to gather information needed to calculate the A/R ratio. At a minimum, the INMP template must be designed to collect the following information:

1. Crop year
2. Owner/Manager name
3. Assessor Parcel Number (APN)
4. Field identification number
5. Acreage
6. Residual nitrogen in soil
7. Crop type
8. Crop production units
9. Crop age (permanent crops)
10. Total acreage
11. Irrigation method
12. Crop evapotranspiration
13. Anticipated crop irrigation
14. Irrigation water nitrogen concentration
15. Projected yield
16. Nitrogen recommended
17. Nitrogen applied in irrigation water
18. Applied synthetic fertilizers
19. Applied organic soil amendments (compost and manure)
20. Total nitrogen applied
21. Primary and secondary crop harvest yield
22. Nitrogen sequestered in wood of permanent crops
23. Total nitrogen removed
24. A/R ratio
25. Aex-R difference
26. Plan certification information

~~The Nitrogen Management Plan template must be developed by the third-party in consultation with the Central Valley Water Board, and as appropriate, the California Department of Food and Agriculture (CDFA), the University of California Extension, and the Natural Resource Conservation Services (NRCS). In developing the template, the third-party should consider, to the extent appropriate, the major criteria established in Code 590 of the NRCS Nutrient Management document, including soil and plant tissue testing, nitrogen application rates,~~

~~nitrogen application timing, consideration of organic nitrogen fertilizer, consideration of irrigation water nitrogen levels.~~

INMP Component (1) – Crop Year

The crop year shall be reported for the calendar year in which the crop is harvested.[17]

INMP Component (2) – Owner/Manager Name

The owner/manager name shall be reported as the name of the individual completing the INMP form. This may be the individual that owns or manages the farm, or the individual certifying the INMP.

INMP Component (3) – Assessor Parcel Number (APN)

The Assessor Parcel Number (APN) shall be reported for each field /management unit.

INMP Component (4) – Field Identification Number

The field identification number shall be reported for each field/management unit and corresponding APN.

INMP Component (5) – Acreage

The acreage shall be reported for each field identified by APN and field identification number.

INMP Component (6) – Residual Nitrogen in Soil

The residual nitrogen in soil shall be reported as nitrogen available to the crop during the growing season. This is estimated by analyzing soil samples.

INMP Component (7) – Crop Type

The crop type shall be reported as the name of the harvested crop (i.e. almonds, walnuts, table grapes, wine grapes, raisin grapes, canning tomatoes, fresh market tomatoes, etc.)

INMP Component (8) – Crop Production Units

The crop production units shall be reported as the standard production units for the reported crop (tons, pounds, bushels, bales, etc.).

INMP Component (9) – Crop Age (permanent crops)

The crop age shall be reported for any permanent crop, including orchards and vineyards, and measured in years.

INMP Component (10) – Total Acreage

The total acreage is the sum of the acreage for each field/management unit reported on the INMP.

INMP Component (11) – Irrigation Method

The irrigation method shall be reported as the method used for the most for crop irrigation during the growing season (drip, furrow, sprinkler, flood, etc.). A crop that germinates seeds using sprinklers before converting irrigation to drip would report drip irrigation as the irrigation method.

INMP Component (12) – Crop Evapotranspiration

The crop evapotranspiration shall be reported as the total crop-specific evapotranspiration for the reported crop during the applicable growing period. This may be estimated using reference evapotranspiration multiplied by an appropriate crop coefficient. Alternatively, the third-party may provide crop appropriate average evapotranspiration values for use by their members.

INMP Component (13) – Anticipated Crop Irrigation

The anticipated crop irrigation can be estimated using the crop evapotranspiration, subtracting the anticipated rainfall and adjusting accordingly for distribution uniformity and

[17] Some crops such as winter cereal grains and some citrus should report information based on the calendar year that the crop is harvested, even if fertilization occurs in the previous calendar year; all nitrogen application information should be provided for the crop harvest year, which may or may not be the same calendar year.

leaching requirement for salinity. A simplified way to adjust for these is to divide by 0.85 such that:

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INMP Component (14) – Irrigation Water Nitrogen Concentration

The irrigation water nitrogen concentration shall be reported as parts per million (ppm) of all available forms of nitrogen. The concentration is estimated by analyzing an irrigation water sample to determine the available nitrogen content.

INMP Component (15) – Projected Yield

The projected yield should be reported as the projected yield per acre for the field(s)/management unit(s) for the upcoming season. The projected yield expectations will guide nitrogen management decisions.

INMP Component (16) – Nitrogen Recommended

The nitrogen recommended shall be reported as the estimated amount of available nitrogen needed to meet the projected yield. Crop recommendations from CDFA, UCCE, NRCS, commodity groups, or site-specific knowledge based on previous experience are appropriate for estimating the amount of nitrogen needed.

INMP Component (17) – Nitrogen Applied in Irrigation Water

The nitrogen applied in irrigation water shall be reported, in pounds per acre, as the estimated amount of nitrogen applied via irrigation water application. This estimate may be based on the anticipated/actual crop irrigation and the irrigation water nitrogen concentration. This estimate should be reported as nitrogen available throughout the crop season based on the amount of irrigation water applied to the crop. For a crop with an irrigation water nitrate concentration in ppm (or mg/L) and a crop irrigation in inches, the multiplier to determine nitrogen applied in irrigation water is 0.052 lbs-N/acre-inch for nitrate measured as nitrate, and 0.226 lbs-N/acre-inch for nitrate measured as nitrogen. (e.g. A crop with 48 inches of applied water with a concentration of 5 ppm nitrate measured as nitrate would apply 5 ppm x 48 inches x 0.052 lbs-N/acre-inch, or 12.5 lbs-N/acre)

INMP Component (18) – Applied Synthetic Fertilizers

The applied synthetic fertilizers are categorized as dry fertilizer, liquid fertilizer, and foliar fertilizer and shall be reported as the amount of the nitrogen portion of all applied synthetic fertilizers in pounds per acre.

INMP Component (19) – Applied Organic Soil Amendments (Compost and Manure)

The applied organic soil amendments include compost and manure and should be reported as the amount of nitrogen available to the plant during the growing period in pounds per acre. Available nitrogen may be measured by testing the applied compost or manure materials or estimated using reference materials that are available for estimating nitrogen content. Caution should be exercised with land application of uncomposted materials, including uncomposted green waste, and other organic amendments containing a high carbon to nitrogen (C:N) ratio due to the potential for significant nitrogen sequestration. This sequestered nitrogen has the potential for bulk rapid release in a very short period of time. If the crop is not prepared to take up this rapid release, there is risk for nitrogen loss to the system.

INMP Component (20) – Total Nitrogen Applied

The total nitrogen applied shall be reported as the sum of the total nitrogen applied in irrigation water, synthetic fertilizers and organic soil amendments.

INMP Component (21) – Primary and Secondary Crop Harvest Yield

The crop harvest yield shall be reported for primary harvest and any secondary crop harvests. The harvest shall be reported in crop production units per acre (i.e. lbs/acre of almonds) and shall include all harvested materials removed from the field, including secondary harvests of rice straw or orchard prunings.

INMP Component (22) – Nitrogen Sequestered in Wood of Perennial Crops

The nitrogen sequestered in wood accounts for the storage of nitrogen in the woody growth of perennial crops such as almonds, peaches, pistachios, etc. The amount of nitrogen

sequestered may vary depending on the age of the crop. This sequestered nitrogen shall be included in the nitrogen removed component of the A/R ratio. The third-party shall determine, through testing and research, or the review of existing research, the most appropriate values for annual nitrogen sequestration for those perennial crops that cover 95% of the acreage in perennial crops for use in the INMP Summary Reports due 1 March 2019.

INMP Component (23) – 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 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 for use in the INMP Summary Reports due 1 March 2019. By 1 March 2021, 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.

INMP Component (24) – Nitrogen Applied/Nitrogen Removed Ratio (A/R Ratio)

The A/R ratio shall be reported as the ratio of total nitrogen applied (INMP Component 20) to total nitrogen removed (INMP Component 23).

INMP Component (25) – Nitrogen Appliedex – Nitrogen Removed Difference (Aex-R Difference)

The Aex-R difference shall be reported as the numerical difference between ~~total~~external nitrogen applied (the sum of INMP Components 18 and 19~~ 20~~) and total nitrogen removed (INMP Component 23).

INMP Component (26) – Irrigation and Nitrogen Management Plan Certification Information

The INMP certification information shall include the name of the plan certifier, the date of plan certification, and certification method used. Appropriate certification methods include certification as an INMP specialist,[18] self-certification via an approved training program, or self-certification by means of following site-specific recommendations provided by UCANR or NRCS.

~~In addition to the Nitrogen Management Plan Template, the third-party must provide a template for the Nitrogen Management Plan Summary Report.~~

Select data from the INMP template will be used to complete the INMP Summary Report. Data collected from the INMP Summary Report will be reported annually to the third-party and the Central Valley Water Board. At a minimum, the INMP Summary Report template must collect the following information:

1. Crop Year
2. Owner/Manager name
3. Assessor Parcel Number (APN)
4. Field identifier
5. Acreage
6. Crop type
7. Crop age (permanent crops)
8. Irrigation method
9. Total Acreage
10. Nitrogen Applied (lbs/acre)
    a. Irrigation Water

[18] Described in section VII.D of the Order

b. Synthetic Fertilizers

c. Organic Amendments

11. Crop Yield (units specified by third-party)

12. Nitrogen Removed[19] via harvest and/or sequestered in permanent wood of perennial crops (lbs/acre)

13. A/R Ratio

14. Aex-R Difference

~~The Nitrogen Management Plan Summary Report Template must provide for reporting of the nitrogen consumption ratio for each crop grown for each parcel enrolled by the Member (this MRP requires reporting of this information to the board by township, Member/parcel need not be specified).~~

~~The Nitrogen Management Plan Summary Report must also gather information required in the Monitoring Report and information needed for the Management Practices Evaluation Program.~~[20]

~~As part of its submittal for approval, the third-party must identify the entities that participated in the development of the Nitrogen Management Plan Template.~~

C. Sediment and Erosion Control Plan Template

Should the third-party choose to develop the Sediment and Erosion Control Plan Template per the Group Option outlined in section VIII.C of the Order, the following provisions apply.

The third-party will create a template to assist Members that must prepare a Sediment and Erosion Control Plan. The goal of the template shall be to assist Members in achieving the farm management performance standards of the Order, which include the requirement to minimize or eliminate the discharge of sediment above background levels. At a minimum, the template must be designed to facilitate Member consideration of the following.

- Identification of locations subject to erosion or locations subject to frequent water flow events that may mobilize sediment (sediment and erosion risk areas). Locations to be evaluated include the fields, roads or stream crossings within the enrolled parcel, and discharge points from the field.
- Identification of practices implemented at sediment and erosion risk areas to minimize or eliminate the discharge of sediment above background levels.

As part of its submittal for approval, the third-party must identify the entities that participated in the development of the Sediment and Erosion Control Plan Template.

VII. 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 Eastern San Joaquin 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.

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[19] 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 be the placeholder for the time being.

[20] ~~The Monitoring Report and MPEP will be developed by the third-party. This template is the mechanism by which the third-party will gather the information necessary to develop the Monitoring Report and conduct the MPEP. As such, this template will be a tool to facilitate Member reporting for third-party studies, analysis, and summary reporting to the board. Unless requested by the Executive Officer, Member completed templates will not be submitted directly to the board.~~

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.

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.

IX. Quality Assurance Project Plan (QAPP)

The third-party must develop and/or maintain a QAPP that includes watershed and site-specific information, project organization and responsibilities, and the quality assurance components in the QAPP Guidelines. Chemical, bacteriological, and bioassay analyses shall be conducted at a 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 East San Joaquin Water Quality Coalition's existing QAPP was approved by the Executive Officer on 25 November 2008. 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 of 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.

Table 5. Basin Plan Numeric Water Quality Objectives for the Eastern San Joaquin River Watershed. ** Where more than one objective is applicable, the most stringent shall be applied.*

Constituent / Parameter (Synonym)	Basin Plan Water Quality Objective	Source of Numeric Threshold *(footnotes in parentheses are at bottom of table)*	Numeric Threshold (a)	Units	C
Boron, total	Chemical Constituents	Basin Plan. SJR, mouth of Merced R to Vernalis (15 Mar – 15 Sep)	2,000	ug/L	
		Basin Plan. SJR, mouth of Merced R to Vernalis (15 Mar – 15 Sep)	800 (b)	ug/L	
		Basin Plan. SJR, mouth of Merced R to Vernalis (16 Sep – 14 Mar)	2,600	ug/L	
		Basin Plan. SJR, mouth of Merced R to Vernalis (16 Sep – 14 Mar)	1,000 (b)	ug/L	
		Basin Plan. SJR, mouth of Merced R to Vernalis (critical year) (c)	1,300 (b)	ug/L	
		Basin Plan. SJR from Sack Dam to mouth of Merced River	5,800	ug/L	
		Basin Plan. SJR from Sack Dam to mouth of Merced River	2,000 (b)	ug/L	
Chlorpyrifos	Pesticides	Basin Plan. SJR from Mendota Dam to Vernalis; 1-hour average	0.025	ug/L	
		Basin Plan. SJR from Mendota Dam to Vernalis; 4-day average	0.015	ug/L	
Coliform, fecal	Bacteria	Basin Plan (d) (e)	200/100	MPN/mL	
		Basin Plan (d) (f)	400/100	MPN/mL	
Coliform, total	Bacteria	Basin Plan	2.2/100	MPN/mL	
Conductivity at 25 C (Electrical conductivity)	Salinity	Basin Plan. SJR, Friant Dam to Mendota Pool	150	umhos/cm	
		California Secondary MCL	900-1600	umhos/cm	
Copper	Chemical Constituents	California Secondary MCL (total copper)	1,000	ug/L	
	Toxicity	California Toxics Rule (USEPA), (g) (dissolved copper)	variable	ug/L	
Diazinon	Pesticides	Basin Plan. SJR from Mendota Dam to Vernalis; 1-hour average	0.16	ug/L	
		Basin Plan. SJR from Mendota Dam to Vernalis; 4-day average	0.10	ug/L	
Dissolved Oxygen, minimum	Dissolved Oxygen	Basin Plan. Merced R from Cressy to New Exchequer Dam, all year	8.0	mg/L	
		Basin Plan. Tuolumne R, Waterford to La Grange, 15 Oct – 15 Jun	8.0	mg/L	
		Basin Plan. Waters designated WARM	5.0	mg/L	
		Basin Plan. Waters designated COLD and/or SPWN	7.0	mg/L	
Lead	Chemical Constituents	California Primary MCL (total lead)	15	ug/L	
	Toxicity	California Toxics Rule (USEPA) (g) (dissolved lead)	variable	ug/L	
Molybdenum, total	Chemical Constituents	Basin Plan. SJR, mouth of Merced R to Vernalis	15	ug/L	
		Basin Plan. SJR, mouth of Merced R to Vernalis (monthly mean)	10	ug/L	
		Basin Plan. SJR, Sack Dam to mouth of Merced R	50	ug/L	
		Basin Plan. SJR, Sack Dam to mouth of Merced R (monthly mean)	19	ug/L	
Nitrate (as nitrogen)	Chemical Constituents	California Primary MCL	10	mg/L	
Nitrite (as nitrogen)	Chemical Constituents	California Primary MCL	1	mg/L	
Nitrate+Nitrite (as nitrogen)	Chemical Constituents	California Primary MCL	10	mg/L	
pH – minimum	pH	Basin Plan	6.5	units	
pH – maximum			8.5	units	
Selenium, total	Chemical Constituents	Basin Plan. SJR, mouth of Merced R to Vernalis	12	ug/L	
		Basin Plan. SJR, mouth of Merced R to Vernalis (4-day mean)	5	ug/L	
		Basin Plan. SJR, Sack Dam to mouth of Merced R	20	ug/L	
		Basin Plan. SJR, Sack Dam to mouth of Merced R (4-day mean)	5	ug/L	
		California Primary MCL	50	ug/L	
	Toxicity	National Toxics Rule (USEPA), 4-day mean	5	ug/L	
Simazine	Chemical Constituents	California Primary MCL	4	ug/L	
Temperature	Temperature	Basin Plan (h)	variable		
Total Dissolved Solids (TDS)	Chemical Constituents	California Secondary MCL, recommended level	500 – 1,000	mg/L	
Turbidity	Turbidity	Basin Plan. Where natural turbidity is <1 NTU	2	NTU	
		Where natural turbidity is between 1 and 5 NTUs, increases shall not exceed 1 NTU.	variable; 2-6	NTU	

		Where natural turbidity is between 5 and 50 NTUs, increases shall not exceed 20%.	variable; 6 - 70	NTU	
		Where natural turbidity is between 50 and 100 NTUs, increases shall not exceed 10 NTUs.	variable; 60-110	NTU	
		Where natural turbidity is greater than 100 NTUs, increases shall not exceed 10%.	variable	NTU	
Zinc	Chemical Constituents	California Secondary MCL (total zinc)	5,000	ug/L	
Zinc	Toxicity	California Toxics Rule (USEPA) (g) (dissolved zinc)	variable	ug/L	

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 nu
f	No more than ten percent of the total number of samples taken during any 30-day period shall exceed this number.
g	These numeric thresholds 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 WARM and COLD waters be increased more than 5 degrees F above natural receiving water temperature.

Abbreviations:

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

Beneficial Uses:

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

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

MUN-MCL – Municipal or domestic supply with default selection of drinking water MCL when available

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

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CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
CENTRAL VALLEY REGION

ORDER R5-2012-0116-R4~~3~~
ATTACHMENT B TO ORDER R5-2012-0116-R4~~3~~
MONITORING AND REPORTING PROGRAM

WASTE DISCHARGE REQUIREMENTS GENERAL ORDER
FOR
GROWERS WITHIN THE EASTERN SAN JOAQUIN RIVER WATERSHED
THAT ARE MEMBERS OF THE THIRD-PARTY GROUP

TABLE OF CONTENTS

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 Eastern San Joaquin River Watershed that are Members of the Third-Party Group, Order R5-2012-0116-R43 (hereafter referred to as the "Order"). 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 Members are meeting water quality objectives. Additional discussion and rationale for this MRP's requirements are provided in Attachment A of the Order.

This MRP establishes specific surface and ground water monitoring, reporting, and electronic data deliverable requirements for the 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.

II. General Provisions

This Monitoring and Reporting Program (MRP) conforms to the goals of the Non-point Source (NPS) Program as outlined in *The Plan for California's Nonpoint Source Pollution (NSP) 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 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 becomes effective on 7 December 2012. The Central Valley Water Board Executive Officer may revise this MRP as necessary. Upon the effective date of this MRP, the third-party, on behalf of the individual Members, shall implement the following monitoring and reporting.

[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.

III. Surface Water Quality Monitoring Requirements

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 different types of monitoring sites described below: 1) Core sites; 2) Represented sites; and 3) Special Project sites. Core sites are monitored comprehensively on an ongoing basis to track trends in surface water quality and to identify water quality problems. Represented sites generally have characteristics similar to, and are, therefore, represented by the Core sites within their common zone.[2] When a water quality problem is identified at a Core site, the represented sites are evaluated and potentially monitored to determine whether the water quality problem is also occurring at the Represented site (some represented water bodies may not have a monitoring site, e.g. in cases when there is no access). Special Project sites are identified and monitored to investigate identified water quality problems. A Core site or Represented site may also be a Special Project site.

1. Core Site Monitoring

At a minimum, surface water monitoring (as described in section III.C.1) within each zone shall be conducted at one of the designated Core sites (see Table 1) for two consecutive years, followed by two years of monitoring at the second Core monitoring site. Core site monitoring shall alternate continuously between the two Core sites. When a water quality objective or trigger limit at a monitored Core site is exceeded, the parameter associated with the exceedance must be monitored for a third consecutive year.[3]

2. Represented Site Monitoring

When a water quality objective or trigger limit is exceeded at a Core site, the third-party must evaluate the potential for similar risks or threats to water quality associated with that parameter at the sites represented by the Core site (Represented sites). The evaluation must be included in the Monitoring Report (see section V below). If pesticide use information or other factors indicate a risk, monitoring for that parameter must be performed in the appropriate Represented water bodies. The proposed monitoring plan must be included in the Monitoring Plan Update (see section III.C below). Any such monitoring must occur for a minimum of two years during the time period of highest risk of exceedance of water quality objectives for that parameter. When a water quality objective at a monitored

[2] As part of their 25 August 2008 Monitoring and Reporting Program Plan (2008 MRPP), the East San Joaquin Water Quality Coalition (the Coalition) designated six zones within its area based on hydrology, crop types, land use, soil types, and rainfall. The zones identified in the 2008 MRPP are the same zones as those identified in Table 1.

[3] If two exceedances have occurred within the two years the Core 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.

Represented site is exceeded, the parameter associated with the exceedance must be monitored for a third consecutive year.[4]

Any watershed area that does not contain a monitoring site due to issues of access or location downstream of urban influence must be represented by the Core sites in that zone. Any applicable surface water quality management plan (SQMP) actions associated with the Core site must take place in these watershed areas (represented drainages without monitoring sites).

3. Special Project Sites

In addition to Core and Represented sites, the third-party may designate 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,[5] or to evaluate sources of identified water quality problems.

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). Core sites and Represented 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).

B. Monitoring Locations

The location of Core and monitored Represented sites are identified in Table 1 below. The third-party may submit written requests (including technical justification) for removal/addition of monitoring sites for approval by the Executive Officer.

Table 1. Third-party Core and Monitored Represented* Sites By Zone

ID	Zone	Site Type	Site Name	Station Code	Latitude	Longitude
B	1	Core	Dry Creek @ Wellsford Rd	535XDCAWR	37.6602	-120.8743
	1	Core	TBD[6]			
F	2	Core	Prairie Flower Drain @ Crows Landing Rd	535XPFDCL	37.4422	-121.0024
	2	Core	TBD			
D	3	Core	Highline Canal @ Hwy 99	535XHCHNN	37.4153	-120.7557
	3	Core	TBD			
E	4	Core	Merced River @ Santa Fe	535XMRSFD	37.4271	-120.6721
	4	Core	TBD			
C	5	Core	Duck Slough @ Gurr Rd	535XDSAGR	37.2142	-120.5596
	5	Core	TBD			
A	6	Core	Cottonwood Creek @ Rd 20	545XCCART	36.8686	-120.1818
	6	Core	TBD			
1	6	Represented	Ash Slough @ Ave 21	545XASAAT	37.05450	-120.41580
2	4	Represented	Bear Creek @ Kibby Rd	535XBCAKR	37.31280	-120.41380
3	6	Represented	Berenda Slough along Ave 18 1/2	545XBSAAE	37.01820	-120.32650
4	4	Represented	Black Rascal Creek @ Yosemite Rd	535BRCAYR	37.33210	-120.39470
6	4	Represented	Canal Creek @ West Bellevue Rd	535CCAWBR	37.36075	-120.54941
7	5	Represented	Deadman Creek @ Gurr Rd	535XDCAGR	37.19360	-120.56120
8	5	Represented	Deadman Creek @ Hwy 59	535DMCAHF	37.19810	-120.48690
9	6	Represented	Dry Creek @ Rd 18	545XDCARE	36.98180	-120.21950

[4] If two exceedances have occurred within the two years the Represented 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.
[5] "Water quality problem" is defined in Attachment E.
[6] "To be determined" (TBD) monitoring sites will be established by the third-party and the Water Board.

11	2	Represented	Hatch Drain @ Tuolumne Rd	535XHDATR	37.51490	-121.01220
12	3	Represented	Highline Canal @ Lombardy Ave	535XHCHNN	37.45560	-120.72070
13	2	Represented	Hilmar Drain @ Central Ave	535XHDACA	37.39060	-120.95820
14	4	Represented	Howard Lateral @ Hwy 140	535XHLAHO	37.30790	-120.78200
15	2	Represented	Lateral 2 1/2 near Keyes Rd	535LTHNKR	37.54780	-121.09274
16	2	Represented	Lateral 5 1/2 @ South Blaker Rd	535LFHASB	37.45823	-120.96726
17	2	Represented	Lateral 6 and 7 @ Central Ave	535LSSACA	37.39779	-120.95971
18	2	Represented	Levee Drain @ Carpenter Rd	535XLDACR	37.47903	-121.03012
19	4	Represented	Livingston Drain @ Robin Ave	535XLDARA	37.31690	-120.74230
20	2	Represented	Lower Stevinson @ Faith Home Rd	535LSAFHR	37.37238	-120.92318
21	4	Represented	McCoy Lateral @ Hwy 140	535XMLAHO	37.30945	-120.78759
22	5	Represented	Miles Creek @ Reilly Rd	535XMCARR	37.25820	-120.47550
35	1	Represented	Mootz Drain Downstream of Langworth Pond	535XMDDLP	37.70551	-120.89438
24	3	Represented	Mustang Creek @ East Ave	535XMCAEA	37.49180	-120.68390
26	1	Represented	Rodden Creek @ Rodden Rd	535XRCARD	37.79042	-120.80790
30	2	Represented	Unnamed Drain @ Hogin Rd	535XUDAHR	37.43129	-120.99380
31	4	Represented	Unnamed Drain @ Hwy 140	535XUDAHO	37.31331	-120.89217
33	2	Represented	Westport Drain @ Vivian Rd	535WDAVR	37.53682	-121.04861

*Monitored Represented sites in the table are not an exhaustive list; the Executive Officer may require the third-party to add monitoring sites for represented water bodies as necessary to meet the requirements of the Order.

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 and to determine whether existing or newly implemented management practices comply with the receiving water limitations of the Order. Surface water 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 Eastern San Joaquin Watershed are causing or contributing to any surface water quality problems.

Surface water assessment monitoring shall be conducted at Core sites and shall consist of the general water quality parameters, nutrients, pathogen indicators, water column and sediment toxicity, pesticides, and metals identified in section III.C.3. 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).[7] The third-party shall continue monitoring as described in the Coalition's 25 August 2008 Monitoring and Reporting Program Plan (2008 MRPP) until the Executive Officer has approved the Monitoring Plan Update. If the there are no proposed or required changes to the previous Monitoring Program Plan or Monitoring Plan Update, the third-party is not required to submit the Monitoring Plan Update.

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 Core or Represented site during non-scheduled years. Parameters of concern may include, but are not limited to, parameters that exceed an applicable water quality objective or water quality trigger (see section VIII).

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.

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

The third-party shall identify storm runoff monitoring criteria that are based on precipitation levels and knowledge of soils or other factors affecting when storm runoff is expected to occur at monitoring sites. The collection of storm runoff samples shall not be contingent upon the timing of other sampling events and could result in monitoring more than once during a month.

2. Monitoring Schedule and Frequency

The third-party shall identify the appropriate monitoring periods (e.g., months, seasons) for all 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 Core and Represented 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. 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 management practice implementation. Water quality is evaluated with both field-measured parameters and laboratory analytical data as listed on Table 2 of this MRP. The pesticides identified as "to be determined" (TBD) on Table 2 shall be identified as part of a process that includes input from qualified scientists and coordination with the Department of Pesticide Regulation. Based on this process, the Executive Officer will provide the third-party with a list of pesticides that require monitoring in areas where they are applied and have the potential to impair water quality.

Parameters that are part of an adopted TMDL that is in effect and for which irrigated agriculture is a source within the Eastern San Joaquin 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 Eastern San Joaquin River Watershed for which irrigated agriculture is a source include the San Joaquin River Deep Water Ship Channel dissolved oxygen; San Joaquin River salt, boron, selenium, diazinon, and chlorpyrifos.

The metals to be monitored at sites within each site 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 warrant monitoring for each site 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., approved MRPP, or previously approved Monitoring Plan Update), the third-party is not required to submit the 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
Gen Phys	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 determined according to the process identified in section III.C.3.	Water	TBD
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 Eastern San Joaquin 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	x
	Grain Size	Sediment	x

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

4. Toxicity Testing

The purpose of 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*, *Pimephales promelas*, and *Selenastrum capricornutum* in the water column. Testing for *C. dubia* and *P. promelas* shall follow the USEPA acute toxicity testing methods.[8] Testing for *S. capricornutum* shall follow the USEPA short-term chronic toxicity testing methods.[9] 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[10] 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)

[8] 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.
[9] 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.
[10] 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.

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 solutions, as defined in the freshwater toxicity testing manual.

Selanastrum capricornutum Pre-Test Treatment

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

b. 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* shall be conducted at each monitoring location established by the third-party for water quality 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, with one sample collected between 15 August and 15 October, and one sample collected between 1 March and 30 April, during each year of monitoring. The *H. azteca* sediment toxicity test endpoint is survival. The Executive Officer may request different sediment sample collection timing and frequency under a SQMP.

All sediment samples must be analyzed for total organic carbon (TOC) and grain size. Analysis for TOC is necessary to evaluate the expected magnitude of toxicity to the test species. 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 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 PUR data 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 follow up with a sediment TIE when there is ≥ 50% reduction in test organism survival as compared to the laboratory control. Sediment TIEs are an optional tool.

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). The studies shall be representative of the effects of changes in management practices for the parameters of concern. Once Special Project Monitoring is required, the third-party must submit a Special Project Monitoring proposal. The proposal must provide the justification for the proposed study design, specifically identifying how the study design will quantify 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 pollutants 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.

D. Surface Water Data Management Requirements

All surface water field and laboratory data must be uploaded into the Central Valley Regional Data Center (CV RDC) database and will be exported to the California Environmental Data Exchange Network (CEDEN) once data have been approved as CEDEN comparable. The third-party will input its data into a replica of the CV RDC database following CV RDC and CEDEN business and formatting rules.

The third-party shall utilize the most current version of the database and update associated lookup lists on a routine basis. The third-party shall ensure that the data loaded meet the formatting and business rules as detailed in the most current version of the document "Format and Business Rules for the CV RDC CEDEN Comparable Database."

The Central Valley Water Board has developed several tools to assist the third-party with processing and loading of its data. These tools, whether required or optional, will help the third-party to efficiently conduct data processing and loading and meet data management requirements.

CEDEN Comparable Field Sheets (Required)

The third-party shall use CEDEN comparable field sheets when entering data. An example CEDEN comparable field sheet can be found on the CV RDC 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. Modified versions of the field sheet may be submitted to the Central Valley Water Board Executive Officer for approval.

Format Quick Guide (Optional Tool)

The Format Quick Guide is a guidance document for the formatting of data tailored specifically for the third-party. It contains a column by column guide for filling out the CV RDC data templates with the applicable required codes. The Central Valley Water Board CV RDC will provide this document, and updates to it, upon request based on an approved monitoring plan and associated QAPP.

EDD Checklist (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. An updated checklist will be made available on the CV RDC website.

Online Data Checker (Optional Tool)

An online data checker was developed to automate the checking of the datasets against the current format requirements and business rules associated with CEDEN comparable data. The data checker can be accessed on the CV RDC webpage. Please note that data submission will not be accepted through this tool; however, the checker can still be used to check data for errors.

Electronic Quality Assurance Program Plan (eQAPP) (Required)

The third-party shall use an eQAPP when collecting and analyzing monitoring data. The eQAPP is a spreadsheet document containing the quality control requirements for each analyte and method as detailed in the most current version of the third-party's approved QAPP. Each analyte, method, extraction, units, recovery limits, QA sample requirement, etc. is included in this document using the appropriate codes required for the CEDEN comparable database. The third-party shall use the document to format the reported data and conduct a quality control review prior to loading. Data that do not meet the project quality assurance acceptance requirements must be flagged accordingly and must include brief notes detailing the problem within the provided comments field. Included in this file are also the most recent CEDEN comparable station name and code list as well as the applicable project CEDEN codes for retrieving data from the CEDEN website once data arrive there.

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 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 Assessment Report, ~~2~~(3) Management Practices Evaluation Program, and ~~3~~(4) Groundwater Quality Trend Monitoring Program.

1. Drinking Water Supply Well Monitoring is designed to identify human health impacts of nitrate contamination and notifying well users of any well contaminations of nitrate above the Maximum Contaminant Level (MCL) for drinking water wells located on agricultural property.

~~1.~~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.~~

~~2.~~3. The overall goal of the Management Practice Evaluation Program (MPEP) is to evaluate the effectiveness of management practices in limiting ~~determine the effects, if any, irrigated agricultural practices have on first encountered groundwater under different conditions that could affect~~ 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).

~~3.~~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

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. By December 31, 2016, Members must initiate sampling of private drinking water supply wells located on their property.
2. Members must either (1) conduct two rounds of initial drinking water supply well monitoring during the first year, or (2) submit existing drinking water supply well sampling data, provided sampling and testing for nitrates was completed using EPA approved methods at least twice within the last 5 years. Initial rounds of drinking water supply well sampling shall be conducted once during the fall (September-December) and once during the spring (March-June), and every five years, thereafter, if the nitrate concentration is below 8 mg/L nitrate+nitrite as N. If any drinking water supply wells have a nitrate concentration equal to or above 8 mg/L nitrate+nitrite as N, a repeat sample must be taken within 12 months, and must be sampled annually thereafter unless an alternative sampling schedule based on trending data for the well is approved by the Executive Officer. All further sampling shall be conducted during the quarter when nitrate concentration was at its maximum, based on initial monitoring. Sampling may cease if a drinking water well is taken out of service and no longer provides drinking water.

3. 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.
4. 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.
5. The results of drinking water supply well monitoring are to be included in the third-party's Monitoring Report. All drinking water supply well monitoring data are to be submitted electronically to the State Water Board's GeoTracker Database and to the Central Valley Water Board.
6. If groundwater monitoring determines that water in any well that is used for or may be used for drinking water exceeds 10 mg/L of nitrate+nitrite as N, the Member or third-party must provide notice to the Central Valley Water Board within 24 hours of learning of the exceedance. For wells on a Member's property, the Central Valley Water Board will require that the Member notify the users within 10 days. Where the Member is not the property owner, the Central Valley Water Board will notify the users promptly.

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.

1. *Objectives.* The main objectives of the GAR are to:
   - Provide an 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.
   - Provide a basis for priorities for implementation of ~~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.
   - Information regarding depth to groundwater, provided as a contour map(s).
   - Groundwater recharge information, including identification of areas contributing recharge to urban and rural communities where groundwater serves as a significant source of supply.
   - Soil survey information, including significant areas of high salinity, alkalinity and acidity.
   - Shallow groundwater constituent concentrations (potential constituents of concern include any material applied as part of the agricultural operation, including constituents in irrigation supply water [e.g., pesticides, fertilizers, soil amendments, etc.] that could impact beneficial uses or cause degradation).

- Information on existing groundwater data collection and analysis efforts relevant to this Order (e.g., Department of Pesticide Regulation [DPR] United States Geological Survey [USGS] State Water Board Groundwater Ambient Monitoring and Assessment [GAMA], California Department of Public Health, local groundwater management plans, etc.). This groundwater data compilation and review shall include readily accessible information relative to the Order on existing monitoring well networks, individual well details, and monitored parameters. For existing monitoring networks (or portions thereof) and/or relevant data sets, the 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.
   - ~~The GAR shall d~~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~~ may 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 or 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 (irrigation method, crop type, nitrogen application and removal rates, etc.). The third-party shall provide the rationale for any 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 default high/low vulnerability groundwater areas using 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:
   - Identification of areas previously designated as high vulnerability.
   - 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 urban and rural communities 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 may also be considered in ~~designating and~~ prioritizing ~~vulnerability~~ areas to comply with the requirements of this Order ~~for groundwater~~. Such data includes, but is not limited to, 1) those areas that have been identified by the State Water Board as Hydrogeologically Vulnerable Areas, 2) California Department of Pesticide Regulation groundwater protection areas, and 3) areas with exceedances of water quality objectives for which irrigated agriculture waste discharges may cause or contribute to the exceedance.

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~~prioritization associated with approval of the Groundwater Quality Assessment Report.

~~B~~C. Management Practice Evaluation Program

The goal of the Management Practice Evaluation Program (MPEP) is to ~~determine~~ evaluate the effectiveness~~, if any~~ of~~,~~ irrigated agricultural practices[11] ~~have~~ with regard to~~on~~ groundwater quality. A MPEP ~~is required 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.D 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:
   - Identify whether existing site-specific and/or commodity-specific management practices are protective of groundwater quality ~~within high vulnerability groundwater areas~~,
   - Determine if newly implemented management practices are improving or may result in improving groundwater quality.
   - Develop an estimate of the effect of Members' discharges of constituents of concern on groundwater quality ~~in high vulnerability areas~~. ~~A mass balance and conceptual model of the transport, storage, and degradation/chemical transformation mechanisms for the constituents of concern, or equivalent method approved by the Executive Officer, must be provided.~~
   - Utilize the results of evaluated management practices to improve the ~~determine whether~~ practices implemented ~~at~~ on ~~represented~~ Member farms ~~(i.e., those~~ not specifically evaluated, but having similar site conditions~~), need to be improved~~.

   ~~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 high vulnerability areas and commodities, and present a phased approach to implement the MPEP.~~

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,

[11] 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.

- 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) ~~of the high vulnerability areas (or commodities within these areas)~~ to be examined under the MPEP shall be prepared and submitted to the Executive Officer as detailed in the Management Practices Evaluation Program Workplan section IV.D 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 Monitoring Report. The report shall include all data[12] (including analytical reports) collected by each phase of the MPEP since the previous report was submitted. The report shall also contain a tabulated summary of data collected to date by the MPEP. The report shall summarize the activities conducted under the MPEP, and identify the number and location of installed monitoring wells relative to each other and other types of monitoring devices. Within each report, the 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 and engineering principles to identify management practices protective of groundwater quality.

   The report shall include an assessment of each management practice to determine which management practices are protective of groundwater quality. If monitoring concludes that management practices currently in use are not protective of groundwater quality based upon information contained in the MPER, and therefore are not confirmed to be sufficient to ensure compliance with the groundwater receiving water limitations of the Order, the 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 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.

~~C~~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.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 trend monitoring requirements.

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

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 monitoring network that will (1) be implemented over ~~both high and low vulnerability~~all 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 monitoring, while still yielding data which can be compared with historical and future data to evaluate long-term groundwater 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 shall submit a proposed Trend Groundwater Monitoring Workplan described in section IV.E 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.

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 monitoring data are to be submitted electronically to the State Water Board's GeoTracker Database and to the Central Valley Water Board.

   Following collection of sufficient data (sufficiency to be determined by the method of analysis proposed by the third-party) 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 in the Trend Groundwater Monitoring Workplan described in section IV.E below.

~~D~~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. ~~situated throughout the high vulnerability groundwater area(s), and~~ It must also encompass~~ing~~ 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.B 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 proposed approach may include:

   - groundwater monitoring,
   - modeling,
   - vadose zone sampling, or
   - other scientifically sound and technically justifiable methods for meeting the objectives of the Management Practices Evaluation Program.

   Where available, ~~Sufficient~~shallow[13] groundwater monitoring data should be collected ~~or available~~ to ~~confirm or~~ validate the conclusions regarding the effect on groundwater

[13] Shallow groundwater in this context refers to groundwater located less than 10 feet below the soil surface, which will exhibit a rapid response to deep percolation (below the root zone) water and nitrate flows.

quality of the evaluated practices ~~on groundwater quality~~. 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 the area from which water entering a well originates than deeper wells and allows~~ identification of changes in groundwater quality from activities on the surface at the earliest possible time.

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

   - the constituents to be assessed, and
   - the frequency of the data collection (e.g., groundwater quality or vadose zone monitoring; soil sampling) for each constituent.

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

3. *Workplan implementation and analysis.* The proposed Management Practices Evaluation Workplan shall contain sufficient information/justification for the Executive Officer to evaluate the ability of the evaluation program to identify whether existing management practices in combination with site conditions, are protective of groundwater quality. The workplan must explain how data collected at evaluated farms will be used to assess potential impacts to groundwater at represented farms that are not part of the Management Practices Evaluation Program's network. This information is needed to demonstrate whether data collected will allow identification of management practices that are protective of water quality at Member farms, including represented farms (i.e., farms for which on-site evaluation of practices is not conducted).

4. *Master workplan –prioritization.* If the third-party chooses to rank or prioritize ~~its high vulnerability~~ 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.

~~E~~F. Trend Monitoring Workplan

The third-party shall develop a workplan for conducting trend monitoring within its boundaries that meets the objectives and minimum requirements described in section IV.C of this MRP. The workplan shall be submitted to the Executive Officer for review and approval. The Trend Monitoring Workplan shall provide information/details regarding the following topics:

1. *Workplan approach.* The Trend Monitoring workplan must include ~~A~~a discussion of the rationale for the number of proposed wells to be monitored and their locations. 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~~ 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.* 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.* Proposed method(s) to be used to evaluate trends in the groundwater monitoring data over time.

Table 3: Trend Monitoring Constituents

Annual Monitoring Conductivity (at 25 °C)* (µmhos/cm) pH* in pH units Dissolved oxygen (DO)* (mg/L) Temperature* (°C) 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.

A. Quarterly Submittals of Surface Water Monitoring Results

Each quarter, the third-party shall submit the previous quarter's surface water monitoring results in an electronic format. The deadlines for these submittals are 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.
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, including drinking water supply well 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 Farm Evaluations

By 1the end of the first year after the adoption of this permit, ~~May 20179~~ and annually thereafter, the third-party shall submit the prior year's Farm Evaluation, as described in Section VI.A below, in pdf format. Once the third-party is notified by the Central Valley Water Board that the State Water Board GeoTracker database is available for uploading Farm Evaluation data, the third-party shall submit the Farm Evaluation data solely by uploading into GeoTracker. 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. Once the GeoTracker database is available, any data not loaded into the GeoTracker database shall be noted with the submittal. The third-party shall maintain an original electronic copy of all Farm Evaluations.

D. Annual Irrigation and Nitrogen Management Plan Summary Report Data

By the end of the first year after the adoption of this permit,~~1 May 20179~~ and annually thereafter, the third-party shall submit the prior year's Irrigation and Nitrogen Management Plan (INMP) Summary Reports in pdf format. Additionally, by 1 May, the third-party shall create and submit an electronic database table containing the individual data values reported from all of the INMP Summary Reports. Once the third-party is notified by the Central Valley Water Board that the State Water Board GeoTracker database is available for uploading INMP Summary Report information, the third-party shall upload the INMP Summary Reports and individual data values into GeoTracker. If any INMP Summary

Comment [1]: I don't think we can require the parties to retroactively submit these docs. The Order is not going to be finalized until later this year. Plus more parties than before are subject to these requirements and thus won't have them ready. Or am I missing something?

Comment [2]: Oops, I meant 2017 (which I'm assuming will be the "first year of implementation of the revised permit"). We could also put something along the lines of, "Within [X] months after adoption of this permit, and annually thereafter"

Comment [3]: I'm just wondering if this will even be feasible in such a short time frame (considering the Order wont be adopted until later this year, presumably at the earliest). For some yes it will be feasible since they're use to doing farm evals annually, but with the revocation of HVA v LVA designations some people won't be use to doing them and I'm not sure how difficult these are to complete. If anyone else thinks it is doable please disregard my concerns.

Comment [4]: I thought we're going with Alternative 2 (from the transmittal letter) for field-level reporting requirements/timeframes (that's what we currently recommend in the comment letter). Under Alternative 2, the third party/coalition would start submitting field-level data to the CV Water Board during the first year of permit implementation, with the recognition that the data would be incomplete for the first two years. From my understanding, this choice b/t a third-year and first-year deadline applies to the coalitions, not the members. The deadline for members is already set at March 2017 (see sections VII.B.1 and VII.D.1 of the revised order [the first part of the order, not this attachment])

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. Once the GeoTracker database is available, any data not loaded into the GeoTracker database shall be noted with the submittal. 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.

E. Monitoring Report

The Monitoring Report shall be submitted by 1 May every year, with the first report due 1 May 2014. 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 ~~[the monitoring report components for the first report does not include Report Component (18), which shall be due by 1 July 2014]~~:

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 Monitoring Report;
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, and water quality management plan milestones, where applicable;
11. Sampling and analytical methods used;
12. 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);
13. Specification of the method(s) used to obtain estimated flow at each surface water monitoring site during each monitoring event;
14. Summary of exceedances of water quality objectives/trigger limits occurring during the reporting period and for surface water related pesticide use information;
15. Actions taken to address water quality exceedances that have occurred, including but not limited to, revised or additional management practices implemented;
16. Evaluation of monitoring data to identify spatial trends and patterns;
17. Summary of Drinking Water Supple Well Monitoring;
~~16.~~18. INMP Summary Report Evaluation ~~Summary of Nitrogen Management Plan information submitted to the third-party~~;
~~17.~~19. Summary of management practice information collected as part of Farm Evaluations;
~~18.~~20. Summary of mitigation monitoring;
~~19.~~21. Summary of education and outreach activities;
~~20.~~22. Conclusions and recommendations.

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

Report Component (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 (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. The source and date of all data layers must be identified on the map(s). All data layers/shapefiles/geodatabases included in the map shall be submitted with the Monitoring Report.

Report Component (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 (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.

Report Component (12) — 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 (14) — Summary of Exceedances

A summary of the exceedances of water quality objectives or triggers that have occurred during the monitoring period is required in the Monitoring Report. 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 (16) — Evaluation of Monitoring Data

The third-party must evaluate its monitoring data in the Monitoring Report in order to identify potential trends 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 are needed. If deficiencies are identified, the third-party must propose a schedule for additional monitoring or source studies. Upon notification from the Executive Officer, the third-party must monitor any parameter in a watershed 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 (17) – Summary of Drinking Water Supply Well Monitoring

The third-party must summarize the results of drinking water supply well monitoring which shall, at a minimum, include the number of drinking water supply wells tested, the number of

notifications of exceedances, any locational trends associated with exceedance notifications, and any trends of increasing or decreasing concentrations in drinking water supply wells.

Report Component (18) – INMP Summary Report Evaluation

In addition to submitting the INMP Summary Reports, 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 total Nitrogen Applied to Nitrogen Removed[14] and the difference between Nitrogen Appliedexe and Nitrogen Removed for crops in the Eastern San Joaquin River Watershed. Total Nitrogen Applied includes nitrogen from any sources, including, but not limited to, organic amendments, synthetic fertilizers, and irrigation water.Nitrogen Appliedex is total nitrogen minus nitrogen added from irrigation water Nitrogen Removed includes nitrogen removal via harvest and nitrogen sequestered in permanent wood of perennial crops.

The third-party shall review each Members' INMP Summary Reports and independently calculate and report both the A/R ratio and the Aex-R difference for the current reporting cycle (A/R1 year and
A-R1 year). 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 Aex-R difference (A/R3 year and Aex-R3 year). The formulas for the A/R ratios and Aex-R differences are shown in the equations below.

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Aex-$R_{1\ year}$ Difference = □□□□□□□□□ □□□□□□□□□ □□□□□□□□ ((□□□□□□□□□□ + □□□□□□□□□)□□□□□□□□ □□□□□□□□□□ □□□□□□) – □□□□□□□□□ □□□□□□□□ (□□□□□□□□ □□□□□□□□□□ □□□□□□)

Aex-$R_{3\ year}$ Difference = [□□□ □□ □□□□□□□□□ □□□□□□□□□ □□□□□□□□ ((*Nsynthetic* + *Norganic*) □□□□□□□□ □□□ □□□ □□□□□□□□□ □□□□□□□□□□ □□□□□□□)]

– [□□□ □□ □□□□□□□□□ □□□□□□□□ (□□□□□□□□ □□□ □□□ □□□□□□□□□ □□□□□□□□□□ □□□□□□□)]

$= (□_{□} + □_{□-1} + □_{□-2}) - (□_{□} + □_{□-1} + □_{□-2})$

Where n = current reporting cycle

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, and further evaluated within each crop type comparing the irrigation method, the soil conditions, and the farming operation size. The third-party shall evaluate the corresponding $A\text{-}R_{1\ year}$ and $Aex\text{-}R_{3\ year}$ differences by crop type. The third-party shall also evaluate any other A/R ratio or Aex-R difference comparisons as directed by the Executive Officer. For each comparison, the third-party must identify the mean and the standard deviation. A box and whisker plot comparing the A/R ratio and Aex-R difference for each comparison, or equivalent tabular or graphical presentation of the data approved by the Executive Officer, may 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 regulatory target

[14] 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.

The third-party must report to the Central Valley Water Board any fields that report $A/R_{3\ year}$ ratios greater than one standard deviation of the mean and notify the Members associated with those fields. The third-party must also report to the Central Valley Water Board what actions have been taken to address fields previously identified to have reported $A/R_{3\ year}$ ratios greater than one standard deviation of the mean.

~~The third-party shall aggregate information from Members' Nitrogen Management Plan Summary Reports to characterize the input, uptake, and loss of nitrogen fertilizer applications by specific crops in the Eastern San Joaquin River Watershed. The third-party's assessment of Nitrogen Management Plan information must include, at a minimum, comparisons of farms with the same crops, similar soil conditions, and similar practices (e.g., irrigation management). At a minimum, the statistical summary of nitrogen consumption ratios by crop or other equivalent reporting units and the estimated crop nitrogen needs for the different crop types and soil conditions will describe the range, percentiles (10^{th}, 25^{th}, 50^{th}, 75^{th}, 90^{th}) and any outliers. A box and whisker plot or equivalent tabular or graphical presentation of the data approved by the Executive Officer may be used. The nitrogen consumption ratio is the ratio of total nitrogen available for crop uptake (from sources including, but not limited to, fertilizers, manures, composts, nitrates in irrigation supply water and soil) to the estimated crop consumption of nitrogen. The summary of nitrogen management 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. The third-party will also provide an aggregate of the data submitted by their Members in an electronic format, compatible with ArcGIS, identified to at least the township level.[15]~~

Report Component (~~18~~19) – Summary of Management Practice Information
The third-party will ~~aggregate and~~ summarize information collected from Farm Evaluations.[16] 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. In addition to summarizing and aggregating the information collected, the third-party will provide the individual data records used to develop this summary in an electronic format, compatible with ArcGIS~~, identified to at least the township level~~.[15] ~~For management practice information provided in Farm Evaluations by Members in their 1 May 2014 submittal to the third-party [per section VII.B.2. of the Waste Discharge Requirements], this Report Component must be submitted to the Central Valley Water Board as an addendum to the Monitoring Report by 1 July 2014.~~

Report Component (~~19~~20) – 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.E 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.

~~D~~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

[15] ~~The Member and their associated parcel need not be identified.~~
[16] 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.

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. For toxicity exceedances, the investigation 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.

VI. ~~Group Option -~~ Templates – Third Party and Group Options

The Order provides the option for the third-party to develop templates as an alternative to templates provided by the Central Valley Water Board's Executive Officer. This section describes the minimum requirements that must be met prior to approval of those templates.

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

A. Farm Evaluation Template

A Farm Evaluation Template meeting the requirements above is provided for use in Appendix MRP-3. Should the third-party choose to develop ~~the~~ a Farm Evaluation Template per the Third-Party or Group Option outlined in section VIII.C.1 of the Order, the following provisions apply.

The third-party ~~must~~ may develop a template or web-based information system to gather Farm Evaluation information from Members for each parcel enrolled. The goal of the template is to gather information on general site conditions and Member management practices in place to protect water quality. At a minimum, the template must be designed to collect the following information.

- Identification of the crops grown and acreage of each crop.
- Location of the farm.
- Identification of on-farm management practices implemented to achieve the Order's farm management performance standards. Specifically track which management practices recommended in management plans have been implemented at the farm. On-farm management practices should include:
  - Pest management application practices
  - Irrigation method(s) and irrigation management practices
  - Nitrogen management practices
  - Sediment and erosion control practices
- Identification of whether or not there is movement of soil during storm events and/or during irrigation drainage events (sediment and erosion risk areas) and a description of where this occurs.
- Identification of whether or not water leaves the property and is conveyed downstream and a description of where this occurs.
- Identification of whether or not one or more of the fields managed by the Member have been identified as having an $A/R_{3\ year}$ ratio greater than the average for similar fields.

- Identification of whether or not one or more of the fields managed by the Member are in an area requiring a SQMP or GQMP.
- Identification of how the Member has their Irrigation and Nitrogen Management Plan certified.
- Location of in-service wells and abandoned wells. Identification of whether wellhead protection and backflow prevention practices have been implemented.

As part of its submittal for approval, the third-party must identify the entities that participated in the development of ~~the~~ any proposed Farm Evaluation Template.

B. Irrigation and Nitrogen Management Plan (INMP) and INMP Summary Report Templates

An Irrigation and Nitrogen Management Plan (INMP) Template and INMP Summary Report meeting the requirements below is provided for use in Appendix MRP-4. Should the third-party choose to develop ~~the~~ a Nitrogen Management Plan Template per the Third-Party or Group Option outlined in section VIII.C.2 of the Order, the following provisions apply.

The third-party may develop a template or web-based information system to gather Irrigation and Nitrogen Management Plan and Summary Report information from Members for each parcel enrolled. The goal of the template is to gather information needed to calculate the A/R ratio. At a minimum, the INMP template must be designed to collect the following information:

1. Crop year
2. Owner/Manager name
3. Assessor Parcel Number (APN)
4. Field identification number
5. Acreage
6. Residual nitrogen in soil
7. Crop type
8. Crop production units
9. Crop age (permanent crops)
10. Total acreage
11. Irrigation method
12. Crop evapotranspiration
13. Anticipated crop irrigation
14. Irrigation water nitrogen concentration
15. Projected yield
16. Nitrogen recommended
17. Nitrogen applied in irrigation water
18. Applied synthetic fertilizers
19. Applied organic soil amendments (compost and manure)
20. Total nitrogen applied
21. Primary and secondary crop harvest yield
22. Nitrogen sequestered in wood of permanent crops
23. Total nitrogen removed
24. A/R ratio
25. Aex-R difference
26. Plan certification information

~~The Nitrogen Management Plan template must be developed by the third-party in consultation with the Central Valley Water Board, and as appropriate, the California Department of Food and Agriculture (CDFA), the University of California Extension, and the Natural Resource Conservation Services (NRCS). In developing the template, the third-party should consider, to the extent appropriate, the major criteria established in Code 590 of the NRCS Nutrient Management document, including soil and plant tissue testing, nitrogen application rates, nitrogen application timing, consideration of organic nitrogen fertilizer, consideration of irrigation water nitrogen levels.~~

INMP Component (1) – Crop Year

The crop year shall be reported for the calendar year in which the crop is harvested.[17]

INMP Component (2) – Owner/Manager Name

The owner/manager name shall be reported as the name of the individual completing the INMP form. This may be the individual that owns or manages the farm, or the individual certifying the INMP.

INMP Component (3) – Assessor Parcel Number (APN)

The Assessor Parcel Number (APN) shall be reported for each field /management unit.

INMP Component (4) – Field Identification Number

The field identification number shall be reported for each field/management unit and corresponding APN.

INMP Component (5) – Acreage

The acreage shall be reported for each field identified by APN and field identification number.

INMP Component (6) – Residual Nitrogen in Soil

The residual nitrogen in soil shall be reported as nitrogen available to the crop during the growing season. This is estimated by analyzing soil samples.

INMP Component (7) – Crop Type

The crop type shall be reported as the name of the harvested crop (i.e. almonds, walnuts, table grapes, wine grapes, raisin grapes, canning tomatoes, fresh market tomatoes, etc.)

INMP Component (8) – Crop Production Units

The crop production units shall be reported as the standard production units for the reported crop (tons, pounds, bushels, bales, etc.).

INMP Component (9) – Crop Age (permanent crops)

The crop age shall be reported for any permanent crop, including orchards and vineyards, and measured in years.

INMP Component (10) – Total Acreage

The total acreage is the sum of the acreage for each field/management unit reported on the INMP.

INMP Component (11) – Irrigation Method

The irrigation method shall be reported as the method used for the most for crop irrigation during the growing season (drip, furrow, sprinkler, flood, etc.). A crop that germinates seeds using sprinklers before converting irrigation to drip would report drip irrigation as the irrigation method.

INMP Component (12) – Crop Evapotranspiration

The crop evapotranspiration shall be reported as the total crop-specific evapotranspiration for the reported crop during the applicable growing period. This may be estimated using reference evapotranspiration multiplied by an appropriate crop coefficient. Alternatively, the

[17] Some crops such as winter cereal grains and some citrus should report information based on the calendar year that the crop is harvested, even if fertilization occurs in the previous calendar year; all nitrogen application information should be provided for the crop harvest year, which may or may not be the same calendar year.

third-party may provide crop appropriate average evapotranspiration values for use by their members.

INMP Component (13) – Anticipated Crop Irrigation

The anticipated crop irrigation can be estimated using the crop evapotranspiration, subtracting the anticipated rainfall and adjusting accordingly for distribution uniformity and leaching requirement for salinity. A simplified way to adjust for these is to divide by 0.85 such that:

INMP Component (14) – Irrigation Water Nitrogen Concentration

The irrigation water nitrogen concentration shall be reported as parts per million (ppm) of all available forms of nitrogen. The concentration is estimated by analyzing an irrigation water sample to determine the available nitrogen content.

INMP Component (15) – Projected Yield

The projected yield should be reported as the projected yield per acre for the field(s)/management unit(s) for the upcoming season. The projected yield expectations will guide nitrogen management decisions.

INMP Component (16) – Nitrogen Recommended

The nitrogen recommended shall be reported as the estimated amount of available nitrogen needed to meet the projected yield. Crop recommendations from CDFA, UCCE, NRCS, commodity groups, or site-specific knowledge based on previous experience are appropriate for estimating the amount of nitrogen needed.

INMP Component (17) – Nitrogen Applied in Irrigation Water

The nitrogen applied in irrigation water shall be reported, in pounds per acre, as the estimated amount of nitrogen applied via irrigation water application. This estimate may be based on the anticipated/actual crop irrigation and the irrigation water nitrogen concentration. This estimate should be reported as nitrogen available throughout the crop season based on the amount of irrigation water applied to the crop. For a crop with an irrigation water nitrate concentration in ppm (or mg/L) and a crop irrigation in inches, the multiplier to determine nitrogen applied in irrigation water is 0.052 lbs-N/acre-inch for nitrate measured as nitrate, and 0.226 lbs-N/acre-inch for nitrate measured as nitrogen. (e.g. A crop with 48 inches of applied water with a concentration of 5 ppm nitrate measured as nitrate would apply 5 ppm x 48 inches x 0.052 lbs-N/acre-inch, or 12.5 lbs-N/acre)

INMP Component (18) – Applied Synthetic Fertilizers

The applied synthetic fertilizers are categorized as dry fertilizer, liquid fertilizer, and foliar fertilizer and shall be reported as the amount of the nitrogen portion of all applied synthetic fertilizers in pounds per acre.

INMP Component (19) – Applied Organic Soil Amendments (Compost and Manure)

The applied organic soil amendments include compost and manure and should be reported as the amount of nitrogen available to the plant during the growing period in pounds per acre. Available nitrogen may be measured by testing the applied compost or manure materials or estimated using reference materials that are available for estimating nitrogen content. Caution should be exercised with land application of uncomposted materials, including uncomposted green waste, and other organic amendments containing a high carbon to nitrogen (C:N) ratio due to the potential for significant nitrogen sequestration. This sequestered nitrogen has the potential for bulk rapid release in a very short period of time. If the crop is not prepared to take up this rapid release, there is risk for nitrogen loss to the system.

INMP Component (20) – Total Nitrogen Applied

The total nitrogen applied shall be reported as the sum of the total nitrogen applied in irrigation water, synthetic fertilizers and organic soil amendments.

INMP Component (21) – Primary and Secondary Crop Harvest Yield

The crop harvest yield shall be reported for primary harvest and any secondary crop harvests. The harvest shall be reported in crop production units per acre (i.e. lbs/acre of

almonds) and shall include all harvested materials removed from the field, including secondary harvests of rice straw or orchard prunings.

INMP Component (22) – Nitrogen Sequestered in Wood of Perennial Crops

The nitrogen sequestered in wood accounts for the storage of nitrogen in the woody growth of perennial crops such as almonds, peaches, pistachios, etc. The amount of nitrogen sequestered may vary depending on the age of the crop. This sequestered nitrogen shall be included in the nitrogen removed component of the A/R ratio. The third-party shall determine, through testing and research, or the review of existing research, the most appropriate values for annual nitrogen sequestration for those perennial crops that cover 95% of the acreage in perennial crops for use in the INMP Summary Reports due 1 March 2019.

INMP Component (23) – 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 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 for use in the INMP Summary Reports due 1 March 2019. By 1 March 2021, 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.

INMP Component (24) – Nitrogen Applied/Nitrogen Removed Ratio (A/R Ratio)

The A/R ratio shall be reported as the ratio of total nitrogen applied (INMP Component 20) to total nitrogen removed (INMP Component 23).

INMP Component (25) – Nitrogen Appliedex – Nitrogen Removed Difference (Aex-R Difference)

The Aex-R difference shall be reported as the numerical difference between ~~total~~external nitrogen applied (the sum of INMP Components 18 and 19~~-20~~) and total nitrogen removed (INMP Component 23).

INMP Component (26) – Irrigation and Nitrogen Management Plan Certification Information

The INMP certification information shall include the name of the plan certifier, the date of plan certification, and certification method used. Appropriate certification methods include certification as an INMP specialist,[18] self-certification via an approved training program, or self-certification by means of following site-specific recommendations provided by UCANR or NRCS.

~~In addition to the Nitrogen Management Plan Template, the third-party must provide a template for the Nitrogen Management Plan Summary Report.~~

Select data from the INMP template will be used to complete the INMP Summary Report. Data collected from the INMP Summary Report will be reported annually to the third-party and the Central Valley Water Board. At a minimum, the INMP Summary Report template must collect the following information:

1. Crop Year
2. Owner/Manager name
3. Assessor Parcel Number (APN)
4. Field identifier
5. Acreage
6. Crop type

[18] Described in section VII.D of the Order

7. Crop age (permanent crops)
8. Irrigation method
9. Total Acreage
10. Nitrogen Applied (lbs/acre)
    a. Irrigation Water
    b. Synthetic Fertilizers
    c. Organic Amendments
11. Crop Yield (units specified by third-party)
12. Nitrogen Removed[19] via harvest and/or sequestered in permanent wood of perennial crops (lbs/acre)
13. A/R Ratio
14. Aex-R Difference

~~The Nitrogen Management Plan Summary Report Template must provide for reporting of the nitrogen consumption ratio for each crop grown for each parcel enrolled by the Member (this MRP requires reporting of this information to the board by township, Member/parcel need not be specified).~~

~~The Nitrogen Management Plan Summary Report must also gather information required in the Monitoring Report and information needed for the Management Practices Evaluation Program.~~[20]

~~As part of its submittal for approval, the third-party must identify the entities that participated in the development of the Nitrogen Management Plan Template.~~

C. Sediment and Erosion Control Plan Template

Should the third-party choose to develop the Sediment and Erosion Control Plan Template per the Group Option outlined in section VIII.C of the Order, the following provisions apply.

The third-party will create a template to assist Members that must prepare a Sediment and Erosion Control Plan. The goal of the template shall be to assist Members in achieving the farm management performance standards of the Order, which include the requirement to minimize or eliminate the discharge of sediment above background levels. At a minimum, the template must be designed to facilitate Member consideration of the following.

- Identification of locations subject to erosion or locations subject to frequent water flow events that may mobilize sediment (sediment and erosion risk areas). Locations to be evaluated include the fields, roads or stream crossings within the enrolled parcel, and discharge points from the field.
- Identification of practices implemented at sediment and erosion risk areas to minimize or eliminate the discharge of sediment above background levels.

As part of its submittal for approval, the third-party must identify the entities that participated in the development of the Sediment and Erosion Control Plan Template.

VII. 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 Eastern San Joaquin 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

[19] 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 be the placeholder for the time being.

[20] ~~The Monitoring Report and MPEP will be developed by the third-party. This template is the mechanism by which the third-party will gather the information necessary to develop the Monitoring Report and conduct the MPEP. As such, this template will be a tool to facilitate Member reporting for third-party studies, analysis, and summary reporting to the board. Unless requested by the Executive Officer, Member completed templates will not be submitted directly to the board.~~

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.

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.

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.

IX. Quality Assurance Project Plan (QAPP)

The third-party must develop and/or maintain a QAPP that includes watershed and site-specific information, project organization and responsibilities, and the quality assurance components in the QAPP Guidelines. Chemical, bacteriological, and bioassay analyses shall be conducted at a 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 East San Joaquin Water Quality Coalition's existing QAPP was approved by the Executive Officer on 25 November 2008. 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 of 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.

Table 5. Basin Plan Numeric Water Quality Objectives for the Eastern San Joaquin River Watershed. ** Where more than one objective is applicable, the most stringent shall be applied.*

Constituent / Parameter (Synonym)	Basin Plan Water Quality Objective	Source of Numeric Threshold *(footnotes in parentheses are at bottom of table)*	Numeric Threshold (a)	Units	G= Groundwater IS= Inland Surface Water	Numeric Threshold Protects D: Groundwater MUN-MCL	Groundwater MUN-Toxicity	Groundwater AGR
Boron, total	Chemical Constituents	Basin Plan. SJR, mouth of Merced R to Vernalis (15 Mar – 15 Sep)	2,000	ug/L	IS			
		Basin Plan. SJR, mouth of Merced R to Vernalis (15 Mar – 15 Sep)	800 (b)	ug/L	IS			
		Basin Plan. SJR, mouth of Merced R to Vernalis (16 Sep – 14 Mar)	2,600	ug/L	IS			
		Basin Plan. SJR, mouth of Merced R to Vernalis (16 Sep – 14 Mar)	1,000 (b)	ug/L	IS			
		Basin Plan. SJR, mouth of Merced R to Vernalis (critical year) (c)	1,300 (b)	ug/L	IS			
		Basin Plan. SJR from Sack Dam to mouth of Merced River	5,800	ug/L	IS			
		Basin Plan. SJR from Sack Dam to mouth of Merced River	2,000 (b)	ug/L	IS			
Chlorpyrifos	Pesticides	Basin Plan. SJR from Mendota Dam to Vernalis; 1-hour average	0.025	ug/L	IS			
		Basin Plan. SJR from Mendota Dam to Vernalis; 4-day average	0.015	ug/L	IS			
Coliform, fecal	Bacteria	Basin Plan (d) (e)	200/100	MPN/mL	IS			
		Basin Plan (d) (f)	400/100	MPN/mL	IS			
Coliform, total	Bacteria	Basin Plan	2.2/100	MPN/mL	G	X		
Conductivity at 25 C (Electrical conductivity)	Salinity	Basin Plan. SJR, Friant Dam to Mendota Pool	150	umhos/cm	IS			
		California Secondary MCL	900-1600	umhos/cm	G & IS	X	X	
Copper	Chemical Constituents	California Secondary MCL (total copper)	1,000	ug/L	G & IS	X		
	Toxicity	California Toxics Rule (USEPA), (g) (dissolved copper)	variable	ug/L	IS			
Diazinon	Pesticides	Basin Plan. SJR from Mendota Dam to Vernalis; 1-hour average	0.16	ug/L	IS			
		Basin Plan. SJR from Mendota Dam to Vernalis; 4-day average	0.10	ug/L	IS			
Dissolved Oxygen, minimum	Dissolved Oxygen	Basin Plan. Merced R from Cressy to New Exchequer Dam, all year	8.0	mg/L	IS			
		Basin Plan. Tuolumne R, Waterford to La Grange, 15 Oct – 15 Jun	8.0	mg/L	IS			
		Basin Plan. Waters designated WARM	5.0	mg/L	IS			
		Basin Plan. Waters designated COLD and/or SPWN	7.0	mg/L	IS			
Lead	Chemical Constituents	California Primary MCL (total lead)	15	ug/L	G & IS	X		
	Toxicity	California Toxics Rule (USEPA) (g) (dissolved lead)	variable	ug/L	IS			
Molybdenum, total	Chemical Constituents	Basin Plan. SJR, mouth of Merced R to Vernalis	15	ug/L	IS			
		Basin Plan. SJR, mouth of Merced R to Vernalis (monthly mean)	10	ug/L	IS			
		Basin Plan. SJR, Sack Dam to mouth of Merced R	50	ug/L	IS			
		Basin Plan. SJR, Sack Dam to mouth of Merced R (monthly mean)	19	ug/L	IS			
Nitrate (as nitrogen)	Chemical Constituents	California Primary MCL	10	mg/L	G & IS	X	X	
Nitrite (as nitrogen)	Chemical Constituents	California Primary MCL	1	mg/L	G & IS	X	X	
Nitrate+Nitrite (as nitrogen)	Chemical Constituents	California Primary MCL	10	mg/L	G & IS	X	X	
pH – minimum	pH	Basin Plan	6.5	units	G & IS	X	X	
pH – maximum			8.5	units	G & IS	X	X	
Selenium, total	Chemical Constituents	Basin Plan. SJR, mouth of Merced R to Vernalis	12	ug/L				
		Basin Plan. SJR, mouth of Merced R to Vernalis (4-day mean)	5	ug/L				
		Basin Plan. SJR, Sack Dam to mouth of Merced R	20	ug/L				
		Basin Plan. SJR, Sack Dam to mouth of Merced R (4-day mean)	5	ug/L				
		California Primary MCL	50	ug/L	G & IS	X		
	Toxicity	National Toxics Rule (USEPA), 4-day mean	5	ug/L	IS			
Simazine	Chemical Constituents	California Primary MCL	4	ug/L	G & IS	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	
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	ug/L	G & IS	X			
Zinc	Toxicity	California Toxics Rule (USEPA) (g) (dissolved zinc)	variable	ug/L	IS				

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	These numeric thresholds 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. How WARM and COLD waters be increased more than 5 degrees F above natural receiving water temperature.

Abbreviations:

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

Beneficial Uses:

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

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

MUN-MCL – Municipal or domestic supply with default selection of drinking water MCL when available

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

***CWC, CWA, and LC -- Remember to make all changes in "Suggesting" Mode so that they're actually saved as "red-line-style changes." You select this in the upper right (where it probably says "Editing" Mode now.) ***

Monitoring and Reporting Program R5-2012-0116-R4~~3~~
Appendix MRP-1
Management Plan Requirements
Surface Water and Groundwater

Table of Contents

December 2012 – Revised [Month Year]

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 Eastern San Joaquin River Watershed that are Members of the Third-Party Group, Order R5-2012-0116-R4~~3~~ (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 areas and completion of other management areas.

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

If a number of management plans are triggered, the 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 East San Joaquin Water Quality Coalition's Management Plan Strategy,[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.

[1] The East San Joaquin Water Quality Coalition Management Plan, with Addendum, was submitted on 24 November 2008 and approved by the Executive Officer on 25 November 2008. References to this Management Plan include the original 24 November 2008 submittal and subsequent changes and updates 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.

B. Physical Setting and Information

1. General Requirements

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

a. Land use maps which identify the crops being grown in the SQMP watershed or GQMP area. For groundwater, these maps may already be presented in the Groundwater Assessment Report (GAR) and may be referenced and/or updated as appropriate. Map(s) must be in electronic format using standard Arc-geographic information system (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 contained in Attachment E of the Order).

   iii. Known water bearing zones, areas of shallow and/or perched groundwater, as well as areas of discharge and recharge to the basin/sub-basin in the GQMP area (rivers, unlined canals, lakes, and recharge or percolation basins).

   iv. Identification of which water bearing zones within the GQMP area are being utilized for domestic, irrigation, and municipal water production.

   v. Aquifer characteristics such as depth to groundwater, groundwater flow direction, hydraulic gradient, and hydraulic conductivity, as known or estimated based on existing information (see definitions contained in Attachment E of the Order).

c. Identification, where possible, of irrigation water sources (surface water origin and/or groundwater) and their available general water chemistry (range of EC, concentrations of major anions and cations, nutrients, TDS, pH, dissolved oxygen and hardness).

C. Management Plan Strategy

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

1. A description of the approach to be utilized by the management plan (e.g., multiple COC's addressed in a scheduled priority fashion, multiple areas covered by the plan with a single area chosen for initial study, or all areas addressed simultaneously [area wide]). Any

prioritization included in the management plan must be consistent with the requirements in section XII of the Order, Time Schedule for Compliance.

2. The plan must include actions to meet the following goals and objectives:
   a. Compliance with the Order's receiving water limitations (section III of the Order), including identification and justification of interim nutrient loading reduction targets and milestones.
   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.
   d. Protection of beneficial users of groundwater impacted by the continued loading of nitrogen to groundwater by agricultural uses in the area.
   e. Timeline for accelerated implementation of order requirements.
   ~~c.~~f. Focused actions to reduce nutrient loading and improve groundwater quality.
3. Identify the duties and responsibilities of the individuals or groups implementing the management plan. This section should include:
   a. Identification of key individuals involved in major aspects of the project (e.g., project lead, data manager, sample collection lead, lead for stakeholder involvement, quality assurance manager).
   b. Discussion of each individual's responsibilities.
   c. An organizational chart with identified lines of authority.
4. Strategies to implement the management plan tasks.
   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) have the potential to accelerate compliance with receiving water limitations, and 5) 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

Comment [1]: I was planning to add something to this GQMPs section regarding A/R and A-R targets, but this text refers back to the receiving water limitations (where I already added language about targets), so adding more may not be necessary. Other thoughts?

Extension, Natural Resources Conservation Service, Resource Conservation District, California Department of Food and Agriculture, or other appropriate groups or agencies.

d. A specific schedule and milestones for the implementation of management practices and tasks outlined in the management plan. Items to be included in the schedule include: 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); 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).

e. Establish measureable performance goals and nutrient loading reduction targets 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.

Comment [2]: Same comment as above

D. Monitoring Methods

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 should address the general requirements and, at a minimum, include the following elements:

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 be utilized to perform data analysis (graphical, statistics, modeling, index computation, or some combination thereof).
2. Identify the information necessary to quantify program effectiveness going forward, including the tracking of management practice implementation, A-R3 year difference results, and $A/R_{3\ year}$ ratio results. The approach for determining the effectiveness of the management practices implemented must be described and related to changes in A-R3 year results and $A/R_{3\ year}$ 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, A-R3 year difference results, and $A/R_{3\ year}$ ratio results must also be described. The process must include a description of how the information from the Farm Evalution and INMP Summary Report ~~will be~~is collected from growers, ~~the type of information being collected,~~ how the information will be verified, and how the information will be reported.

F. Records and Reporting

By 1 May of each year, the third-party must prepare a Management Plan Progress Report that summarizes the progress in implementing management plans. The Management Plan Progress Report must summarize the progress for the hydrologic water year.[2] The Management Plan Progress Report shall include the following components:

(1) Title page
(2) Table of contents
(3) Executive Summary
(4) Location map(s) and a brief summary of management plans covered by the report
(5) Updated table that tallies all exceedances for the management plans
(6) A list of new management plans triggered since the previous report
(7) Status update on preparation of new management plans
(8) A summary and assessment of management plan monitoring data collected during the reporting period 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-R3 year difference and $A/R_{3\ year}$ ratio when evaluating a GQMP

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

(12) An evaluation of progress in meeting performance goals and schedules

(13) Any recommendations for changes to the management plan

~~(13)~~(14) Estimate of cumulative N loading in area covered by GQMP, whether or how much that has changed from the prior year's summary report, and whether the GQMP is on track towards meeting its interim N loading reduction target.

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 their 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 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. 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. Stakeholder comments will be considered by

Central Valley Water Board staff. 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 and/or meeting interim nutrient loading reduction targets. Central Valley Water Board staff will meet with the third-party and other interested parties to evaluate the sufficiency 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, nutrient loading reduction targets 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, nutrient loading reduction targets 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.
- Requirement to provide replacement water to impacted groundwater users

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) 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 one or more management plan 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.