

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
CENTRAL VALLEY REGION

ATTACHMENT A to Order R5-2013-XXXX
INFORMATION SHEET

WASTE DISCHARGE REQUIREMENTS GENERAL ORDER
FOR
DISCHARGES FROM IRRIGATED LANDS WITHIN THE CENTRAL VALLEY REGION
FOR DISCHARGERS NOT PARTICIPATING IN A THIRD-PARTY GROUP

Table of Contents

Overview	2
Introduction	2
Goals and Objectives of the Irrigated Lands Regulatory Program	4
Description of the Central Valley Region.....	4
Surface and Groundwater Quality Monitoring	9
<i>Surface Water Quality Monitoring</i>	9
<i>Pesticides for Surface Water Monitoring</i>	9
<i>Surface Water Exceedance Plans (SWAPs)</i>	11
<i>Groundwater Quality Monitoring</i>	12
<i>Groundwater Monitoring Advisory Workgroup</i>	12
<i>Groundwater Monitoring Program</i>	12
<i>Groundwater Exceedance Plans (GWAPs)</i>	13
<i>Farm Water Quality Plan (FWQP)</i>	14
<i>Nitrogen Management Plan (NMP)</i>	15
Water Quality Objectives.....	16
<i>Implementation of Water Quality Objectives</i>	17
<i>Water Quality Triggers</i>	18
Non-point Source (NPS) Program.....	18
California Environmental Quality Act (CEQA)	20
<i>Mitigation Measures</i>	22
Statement of Policy with Respect to Maintaining High Quality Waters in California (State Water Board Resolution 68-16).....	22
<i>Background</i>	23
<i>Application of Resolution 68-16 Requirements to this Order</i>	27
<i>Consistency with BPTC and the “Best Efforts” Approach</i>	28
<i>Summary</i>	32
California Water Code Sections 13141 and 13241	35
California Water Code Section 13263	38

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Overview

This attachment to Waste Discharge Requirements General Order for Discharges from Irrigated Lands within the Central Valley Region for Dischargers not Participating in a Third-Party group, Order R5-2013-XXXX (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 approximately 7.8 million acres of land. 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 (California Water Code ([CWC](#)), section 13050[e]).

The Central Valley Water Board completed an [Existing Conditions Report](#)¹ (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)² and Economics Report³ 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. Towards this goal, on 7 December 2012 the board adopted 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.

This Order regulates irrigated lands owners/operators that are not part of a third-party group. It is [currently](#) the only long-term irrigated lands program order that would implement waste discharge requirements applicable to individual growers not participating in a third-party group, or coalition.

¹ California Regional Water Quality Control Board, Central Valley Region, and Jones and Stokes. 2008. *Irrigated Lands Regulatory Program Existing Conditions Report*. Sacramento, CA.

² 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.

³ ICF International. 2010. *Draft Technical Memorandum Concerning the Economic Analysis of the Irrigated Lands Regulatory Program (Economics Report)*. July. (ICF 05508.05.) Sacramento, CA. [Prepared for Central Valley Regional Water Quality Control Board, Sacramento, CA \(Economics Report\)](#).

Goals and Objectives of the Irrigated Lands Regulatory Program

The goals and objectives of this Order, which implements the long term ILRP for growers not participating in a third-party group, are described below. These are the goals described in the PEIR for the ILRP.⁴

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

- *Restore and/or maintain appropriate beneficial uses established in Central Valley Water Board water quality control plans by ensuring that all state waters meet applicable water quality objectives.*
- *Encourage implementation of management practices that improve water quality in keeping with the first objective, without jeopardizing the economic viability for all sizes of irrigated agricultural operations in the Central Valley or placing an undue burden on rural communities to provide safe drinking water.*
- *Provide incentives for agricultural operations to minimize waste discharge to state waters from their operations.*
- *Coordinate with other Central Valley Water Board programs, such as the Grasslands Bypass Project WDRs for agricultural lands total maximum daily load development, CV-SALTS, and WDRs for dairies.*
- *Promote coordination with other regulatory and non-regulatory programs associated with agricultural operations (e.g., DPR, the California Department of Public Health [DPH] Drinking 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.”*

Description of the Central Valley Region⁵

The Central Valley region stretches from the Oregon border to the northern tip of Los Angeles County and includes all or part of 38 of the state’s 58 counties. Three major watersheds have been delineated within this region, namely the Sacramento River Basin, the

⁴ PEIR, page 2-6

⁵ Adapted from the December 2008 *Irrigated Lands Regulatory Program Existing Conditions Report*, ICF Jones and Stokes.

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San Joaquin River Basin, and the Tulare Lake Basin. The three basins cover about 40 percent of the total area of the state and approximately 75 percent of the irrigated acreage. Much of the surface water supplies in the Central Valley originate north of the Sacramento–San Joaquin River Delta (Delta), while much of the water use is south of the Delta. While there is plenty of surface water in the Sacramento River Basin to meet the present level of demand, surface water supplies in the San Joaquin River and Tulare Lake Basins are inadequate to support the present level of agriculture and other development. In these basins, groundwater resources are being used to meet existing water supply demands.

The crests of the Sierra Nevada on the east and the Coast Ranges and Klamath Mountains on the west border the Sacramento and San Joaquin River Basins. The Sacramento and San Joaquin River Basins cover about one-fourth of the total area of the state and contain over 43 percent of the state’s irrigable land. Surface waters from these two basins meet and form the Delta, which ultimately drains to San Francisco Bay. Major groundwater resources underlie both river valley floors.

The Sacramento River Basin covers 27,210 square miles. The principal streams in the basin are the Sacramento River and its larger tributaries: the Pit, Feather, Yuba, Bear, and American Rivers on the east; and Cottonwood, Stony, Cache, and Putah Creeks on the west. Major reservoirs include Shasta, Oroville, and Folsom.

The San Joaquin River Basin covers 15,880 square miles. The principal streams in the basin are the San Joaquin River and its larger tributaries: the Cosumnes, Mokelumne, Calaveras, Stanislaus, Tuolumne, Merced, Chowchilla, and Fresno Rivers. Major reservoirs include Pardee, New Hogan, Comanche, Millerton, McClure, Don Pedro, and New Melones.

The Tulare Lake Basin comprises the drainage area of the San Joaquin Valley south of the San Joaquin River and encompasses approximately 17,650 square miles. The valley floor makes up slightly less than one-half the total basin land area. The Kings, Kaweah, Tule, and Kern Rivers, which drain the west face of the Sierra Nevada, provide the bulk of the surface water supply native to the basin. Major reservoirs are Pine Flat, Kaweah, Success, and Isabella. Imported surface water enters the Tulare Lake Basin through the San Luis Canal/California Aqueduct System, Friant-Kern Canal, and the Delta-Mendota Canal. This watershed comprises the entire valley floor and is called the South Valley Floor Watershed.

There are approximately 7.8 million acres of irrigated agricultural land within the Central Valley, although approximately 560,000 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.

Figure 1 (Thiros 2010) shows the generalized geology of the Central Valley region.⁶ The Central Valley is a large sediment-filled trough, thousands of feet thick in some locations. Scattered throughout the sediment-filled trough in the subsurface exist many lenses at varying

⁶ 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.

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depths of fine-grained deposits, including Corcoran Clay deposits in the San Joaquin Basin, which form confining layer(s) (Figure 2, Bertold, Johnston, Evenson 1991).⁷ 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.

Figure 1. Generalized geology of the Central Valley Region – adapted from Thiros (2010)

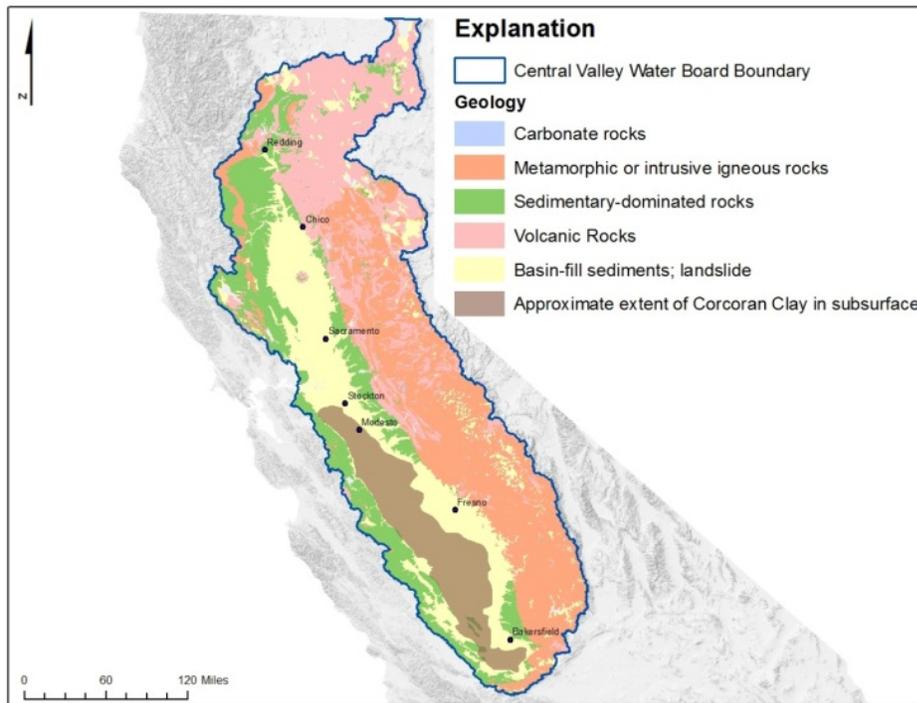
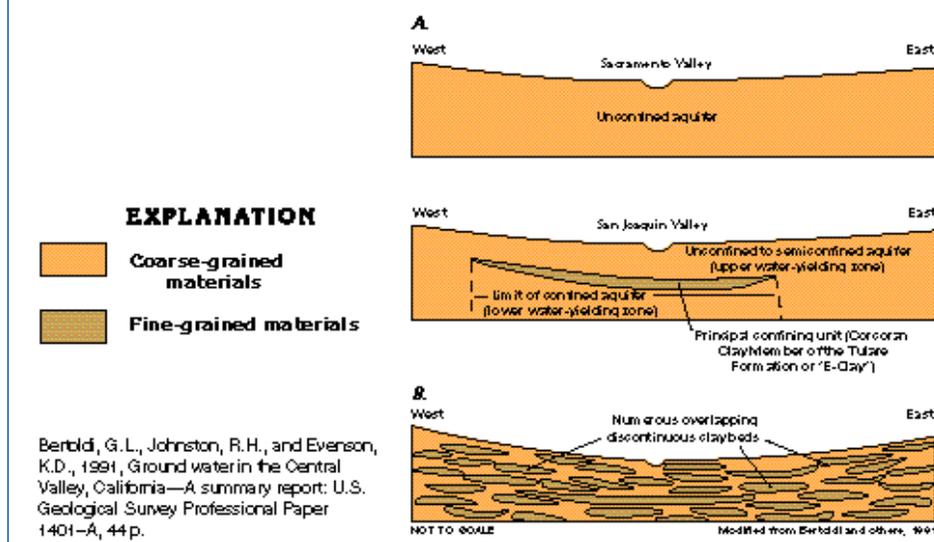


Figure 2. Cross-sectional diagram of groundwater confining layers in the Central Valley region– Bertold, Johnston, and Evenson (1991)

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⁷ 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 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.



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Figure 3. Generalized diagram for the Central Valley, showing the basin-fill deposits and components of the groundwater system under modern conditions – Thiros (2010)

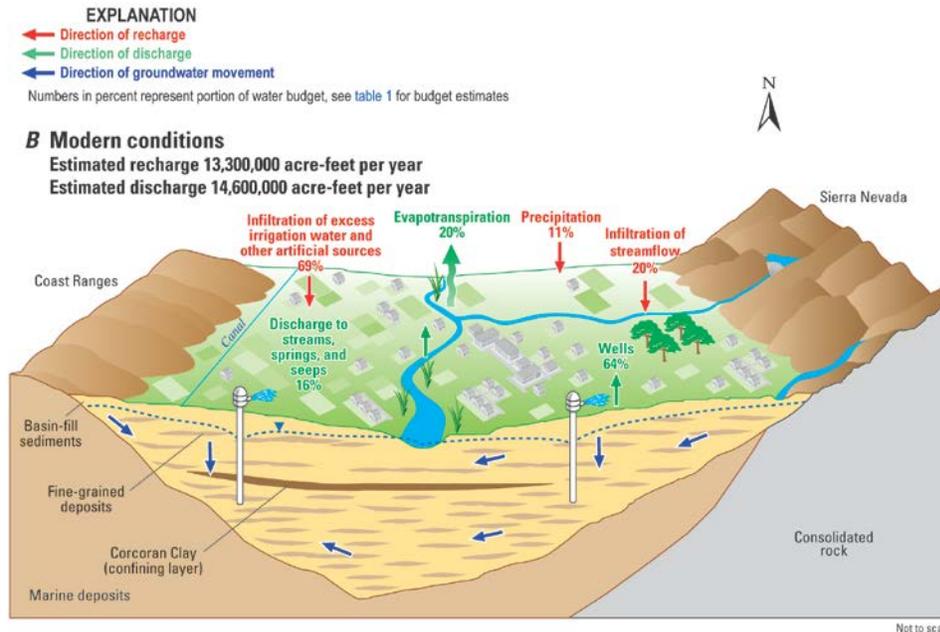


Table 1. Land use characteristics of Central Valley Region basins.⁸

	Sacramento River Basin	San Joaquin River Basin	Tulare Lake Basin	Region 5 Totals
Agricultural Land Use (thousands of acres):				
Citrus & subtropical	33	9	237	279
Deciduous fruits & nuts	392	511	602	1,505
Field crops	185	570	1,062	1,817
Grains	242	153	342	737
Idle cropland	87	30	48	165
Pasture	506	433	382	1,321
Rice	605	21	0	626
Truck, nursery & berry crops	116	221	254	591
Vineyard	36	254	444	734
TOTAL⁹	2,202	2,202	3,371	7,775

⁸ Land use acreages compiled from the Department of Water Resources Land Use Survey GIS data, 1994-2008.

⁹ Approximately 560,000 of the irrigated agricultural acres within the Central Valley are covered under the Dairy General Order.

Surface and Groundwater Quality Monitoring

Surface Water Quality Monitoring

Growers under this Order will be required to monitor discharges of storm water, irrigation tailwater, and tile drainage discharge from their farms that may reach surface waters of the state. Required constituents for monitoring include flow, turbidity, temperature, pH, electrical conductivity, dissolved oxygen, nitrate, nitrite, ammonia, *E. coli*, and ~~high-risk~~ pesticides (see section describing ~~high-risk~~ pesticides below). Growers will also be required to monitor sediment toxicity at their off-site discharge points if pyrethroid pesticides or chlorpyrifos are used. Growers will be required to monitor the first and final irrigation discharges of the growing season, as well as the first event of the storm season. There are additional monitoring events that may be required depending on pesticide application and fertigation timings.

The individual surface water quality monitoring requirements ~~have been designed~~ are necessary to answer the following questions:

1. Is the irrigated agricultural operation in compliance with the Order?
2. Are implemented management practices effective in meeting applicable receiving water limitations?
3. Are the applicable surface water ~~exceedance~~ action plans effective in addressing identified water quality problems?

~~This~~ The required surface water monitoring addresses the above questions because the monitoring results will be compared with water quality triggers to assess compliance with water quality objectives and determine the effectiveness of management practices. If discharges are not meeting water quality trigger levels, management practices will need to be adjusted or new ones implemented to achieve trigger levels. Because trigger levels are based on water quality objectives, meeting the triggers will ensure that the discharge meets the Orders receiving water limitations. The surface water ~~exceedance~~ action plans (SWEPSWAP) will lay out what will be done and track the progress when triggers are not met or where there is degradation that may threaten an applicable beneficial use, and management practices are not yet effective. Monitoring subsequent to additional management practice implementation will assess the effectiveness of the new practices.

This field-level monitoring design differs from the representative monitoring of receiving waters under the third-party orders, and is appropriate due to the sporadic nature of the discharges covered under this Order. This Order is designed to regulate individual farms that have chosen not to participate in, that no longer qualify for participation, or otherwise do not participate in a third-party group. Consequently, individual monitoring is needed to evaluate compliance with the provisions of the Order.

Pesticides for Surface Water Monitoring

The surface water monitoring requirements for pesticides were written in consideration of the California Department of Pesticide Regulation's (DPR) regulatory program. Rather than require monitoring for all pesticides used by irrigated agriculture in the Central Valley, which includes hundreds of different active ingredients, board staff used available information on pesticides that pose a threat to surface water to create a subset list required for monitoring. This prioritization is intended to focus the growers' resources where water quality threats are highest. Initial prioritization criteria included pesticides on the 303(d) list, ILRP management plan pesticides,

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and high overall relative risk level pesticides (Pesticide TMDL Staff Report, February 2009). Next, staff removed pesticides that are not registered for legal use in California. Finally, staff considered available monitoring data and removed pesticides with data indicating that surface water exceedances are not likely to occur. This included pesticides where substantial data existed and where there were either no detections or detections were below toxicity levels. Pesticides remain on the monitoring list if there is not monitoring data available, if there is limited data available, or if there are detections above toxicity levels. DPR staff provided input on the draft pesticide monitoring list, which was further refined based on DPR's comments. The surface water monitoring list for pesticides is intended to be updated periodically to reflect newly available information. Staff intend to review, and if needed, update the list based on monitoring data and other available information every five years. Staff intend to notify interested parties of any proposed changes to the list of pesticides.

Growers are required to monitor the first irrigation and/or storm event discharge that occurs within six months60-days of an application of certain pesticides listed in the MRP. These pesticides were chosen ~~due to using the relatively high water risks posed by these pesticides as compared to other pesticides process described above.~~ If there is no discharge within six months60-days of an application, no sample collection will be required. This sampling requirement is triggered each time a listed pesticide is used. In developing surface water monitoring requirements, the board reviewed information on environmental degradation of pesticides (half-lives) and consulted with DPR management practice requirements for runoff groundwater protection areas. Runoff groundwater protection area requirements were considered because some of the pesticides to be monitored are also DPR groundwater protection list pesticides, e.g., simazine (California Code of Regulations, Title 3, 6800(a)). Average half-lives for the MRP pesticides vary considerably, ranging from less than a day to 56 days in surface water and 2,800 days in soil.^{10,11} DPR has ~~developed management practices for runoff groundwater protection areas provided the recommendation that include measures to ensure that the pesticide remains60-days would allow for most of the pesticides to undergo substantial degradation based on site (e.g., band treatment, incorporation of its analysis of dissipation half-lives. Therefore, the pesticide, soil disturbance, timing of application).~~¹² DPR's ~~runoff protection practices also includes~~ sampling for these pesticides is targeted to evaluate the option for retention of all irrigation and rain runoff on the field for six months following application.¹³ ~~Because DPR has associated a higher risk of pesticide runoff when irrigation/storm water discharge is within six months of application, the MRP requires monitoring of certain pesticides if there is quality of runoff prior to six months of application. Monitoring is not required for DPR, Title 3, 6800(a) pesticides where the Discharger is implementing~~

¹⁰ University of Hertfordshire Pesticide Properties Database (FOOTPRINT PPDB). Database available online at: <http://sitem.herts.ac.uk/aeru/footprint/en/index.htm>.

¹¹ DPR Environmental Monitoring Branch, 2012. Methodology for Evaluating Pesticides for Surface Water Protection I: Initial Screening. Report available online at: <http://www.cdpr.ca.gov/docs/emon/surfwtr/review/report1.pdf>.

¹² ~~CCR, Title 3, section 6487.4.~~

¹³ ~~This practice is not required, but may be selected instead of other practices required by DPR to prevent runoff of 6800(a) pesticides in groundwater protection areas.~~

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~~applicable DPR use the 60-day mark. This requirement management practices for runoff groundwater protection areas (CCR, Title 3, section 6487.4) will reduce costs by focusing sampling during the period of time when the pesticides have not undergone substantial degradation, rather than requiring pesticide sampling for each runoff event. This requirement provides the incentive for Dischargers to institute practices that will hold runoff during high-risk periods (i.e., prior to 60 days).~~

Under DPR's pesticide use reporting system, growers are required to report all pesticide use monthly to the local agricultural commissioner. Staff intends to utilize this established reporting system to evaluate Dischargers' compliance with the requirement to sample within ~~six months~~60-days of an application of a MRP pesticide. Staff ~~will~~intends to conduct verification reviews of reported usage versus monitoring reported in the annual monitoring reports to assess whether monitoring was conducted in compliance with Order requirements.

Surface Water ~~Exceedance~~Action Plans (~~SWEPs~~SWAPs)

Surface water ~~exceedance~~action plans (~~SWEPs~~SWAPs) are the key mechanisms under this Order to help ensure that waste discharges from irrigated lands are meeting the Order's Surface Water Receiving Water Limitation A.1. ~~SWEPs~~SWAPs are required when grower-specific surface water discharge monitoring results exceed an applicable water quality objective or trigger limit twice in a three year period for the same constituent. ~~The main elements of SWEPs~~SWAPs will also be triggered if the Executive Officer determines monitoring results indicate a trend in degradation that may threaten applicable Basin Plan beneficial uses. The main elements of SWAPs are to (1) describe the constituents of concern and exceedances, (2) describe the onsite source(s) of the constituent of concern, (3) ~~evaluate the potential practices that could be employed to control the sources of the constituent,~~ (4) describe and justify the practices chosen to be implemented and proposed monitoring to evaluate effectiveness of practices, (5) ~~propose a time schedule for implementation of the management practices and for achieving to address the problem triggering the SWAP (including, but not limited to reducing the discharge of the constituent(s) to achieve compliance with the Order's receiving water quality triggers, limitation for surface water),~~ and (6) ~~provide updates to the Central Valley Water Board within the annual monitoring reports on the progress made towards completing the SWEP~~SWAP.

Elements 1 through ~~6~~5 are necessary to establish a process by which the Discharger and the Central Valley Water Board are able to investigate waste sources and the important physical factors on the farming operation that may impact management decisions (elements 1 and 2), implement a process to ensure effective practices are adopted by Dischargers where needed (~~element~~element 3 ~~and~~ 4), ensure that compliance with water quality objectives and triggers occurs within a reasonable amount of time (element ~~5~~4), and facilitate efficient board review of data collected on the progress of the ~~SWEP~~SWAP (element ~~6~~5).

The ~~SWEPs~~SWAPs required by this Order require the Discharger to include the above elements. ~~SWEPs~~SWAPs will be reviewed and approved by the Executive Officer.

The burden of the ~~SWEP~~SWAP, including costs, is reasonable. Absent a third-party to conduct monitoring, collect information on management practices, and evaluate those practices, the Central Valley Water Board must be informed of the efforts being undertaken by irrigated agricultural operations to address identified surface water quality problems. The benefits and

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necessity of individual reporting 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 Monitoring

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 (NO₃-N) and salinity. In addition to addressing the widespread nitrate problems, the presence of nitrates in groundwater at elevated levels would serve as an indicator of other potential problems associated with irrigated agricultural practices.

Groundwater Monitoring Program

The objective of the individual groundwater monitoring program is to characterize existing groundwater quality at the agricultural operation (GMAW question 1), identify whether existing

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management practices are protective of groundwater quality (GMAW question 2), and to assess the effectiveness of any newly implemented management practices instituted to improve groundwater quality (GMAW questions 4 and 7). Central Valley Water Board staff utilized the recommended salinity and nitrate parameters and added ammonium and some general minerals that may be mobilized by agricultural operations. In addition, groundwater monitoring will include the pesticides listed in Title 3, Section 6800(a) of the California Code of Regulations, if the pesticide is used by the Discharger. These pesticides have been designated as having the potential to pollutedegrade groundwater. The board considered the above Groundwater Monitoring Advisory Workgroup questions in developing the Order's groundwater monitoring requirements.

A management practices evaluation workplan is to be developed where known groundwater quality impacts exist or where conditions make groundwater more vulnerable to impacts from irrigated agricultural activities (high vulnerability groundwater areas). The purpose of the workplan is to identify whether existing management practices are protective of groundwater quality and to assess the effectiveness of any newly implemented management practices instituted to improve groundwater quality. The workplan must be designed to identify whether existing management practices are protective of groundwater quality and whether the waste discharge is achieving compliance with the Order's groundwater limitation: and other requirements (e.g., farm management performance standards).

The board does not prescribe the method or tools to be used by the Discharger in preparing the management practices evaluation workplan. The Discharger 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 workplan will likely propose using a variety of tools, such as vadose zone monitoring, modeling, and groundwater monitoring. Existing monitoring wells can be utilized where available for the management practices evaluation workplan.

The Order requires that Dischargers conduct existing well characterization monitoring for pH, dissolved oxygen, temperature, conductivity, nitrate, nitrite, general minerals, and DPR 6800(a) pesticides. This monitoring will inform whether Dischargers need to develop a management practices evaluation workplan and for which constituents of concern the plan should be developed. If groundwater quality problems are found, Dischargers will be required to develop orand implement a groundwater action plan and modify an existing management practices evaluation workplan to assess whether its practices are protective of groundwater quality with respect to the water quality problem.

This individual groundwater monitoring design differs from the groundwater monitoring under the third-party orders, and is appropriate due to the sporadic nature of the discharges covered under this Order. This Order is designed to regulate individual farms that have chosen not to participate in, that no longer qualify for participation, or otherwise do not participate in a third-party group. Consequently, individual monitoring is needed to evaluate compliance with the provisions of the Order.

Groundwater ExceedanceAction Plans (GWEPsGWAPs)

Groundwater exceedanceaction plans (GWEPsGWAPs) are the key mechanisms under this Order to help ensure that waste discharges from irrigated lands are meeting the Order's Groundwater Limitation II.B.1. GWEPsGWAPs are required when groundwater monitoring

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shows that the discharge is causing or contributing to groundwater quality conditions that exceed applicable water quality objectives or trigger limits or where management practices currently in use are not protective of groundwater quality based upon information contained in the management practices evaluation report, and therefore are not confirmed to be sufficient to ensure compliance with the groundwater receiving water limitations of the Order. ~~The main elements of GWEPs~~GWAPs will also be triggered if the Executive Officer determines monitoring results indicate a trend in degradation that may threaten applicable Basin Plan beneficial uses. ~~The main elements of GWAPs~~ are to (1) describe the constituents of concern and exceedances, (2) describe the onsite source(s) of the constituent(s) of concern, (3) ~~evaluate the potential practices that could be employed to control the sources of the constituent(s),~~ (4) describe and justify the practices chosen to be implemented and proposed monitoring to evaluate effectiveness of practices (coordinated with management practices evaluation workplan), (54) propose a time schedule for implementation of the management practices ~~and~~ to address the problem triggering the GWAP (including, but not limited to reducing the discharge of the constituent(s) to achieve compliance with the Order's receiving water limitation for groundwater~~),~~ and (65) provide updates to the Central Valley Water Board within the annual monitoring reports on the progress made towards completing the ~~GWEP~~GWAP.

Elements 1 through 65 are necessary to establish a process by which the Discharger and the Central Valley Water Board are able to investigate waste sources and the important physical factors on the farming operation that may impact management decisions (elements 1 and 2), implement a process to ensure effective practices are adopted by Dischargers where needed (~~element~~element 3 and 4), ensure that compliance with water quality objectives and triggers occurs within a reasonable amount of time (element 54), and facilitate efficient board review of data collected on the progress of the ~~GWEP~~GWAP (element 65).

The ~~GWEPs~~GWAPs required by this Order require the Discharger to include the above elements. ~~GWEPs~~GWAPs will be reviewed and approved by the Executive Officer.

The burden of the ~~GWEP~~GWAP, including costs, is reasonable. Absent a third-party to conduct monitoring, collect information on management practices, and evaluate those practices, the Central Valley Water Board must be informed of the efforts being undertaken by irrigated agricultural operations to address identified groundwater quality problems. The benefits and necessity of individual reporting 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 groundwater of improved water quality.

Farm Water Quality Plan (FWQP)

The Order requires the Discharger to develop a farm-specific water quality plan which describes management practices implemented to protect surface and groundwater quality. The plan will also include information such as location and size of the farm, surface water discharge points, water quality sampling locations, pesticides used, and a nitrogen management plan.

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Nitrogen Management Plan (NMP)

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.^{14,15} There are ~~a number of many~~ wells within the Central Valley region with nitrate concentrations that are higher than drinking water quality objectives. To address these concerns, the Order requires that Dischargers implement practices that minimize excess nitrogen application relative to crop ~~need~~consumption. Proper nutrient management will work to reduce excess plant nutrients, such as nitrogen, from reaching state waters. Nitrogen management must take site-specific conditions into consideration in identifying steps that will be taken and practices that will be implemented to minimize nitrate movement through surface runoff and leaching past the root zone.

The Order requires that all Dischargers develop a NMP as part of the farm water quality plan. The purpose of the NMP is to document that the Discharger has a plan to budget for and manage the nitrogen applied, considering all sources of nitrogen, crop ~~requirements~~consumption, soil types, climate, and local conditions, in order to prevent adverse impacts to the beneficial uses of surface water and groundwater. For Dischargers within a high vulnerability groundwater area, the nitrogen management plan must be certified in one of the following ways:

- Self-certified by a Discharger who attends a California Department of Food and Agriculture or other Executive Officer approved training program for nitrogen plan certification. The Discharger must retain written documentation of their attendance in the training program; or
- Self-certified by the Discharger that the plan adheres to a site-specific recommendation from the Natural Resources Conservation Service (NRCS) or the University of California Cooperative Extension. The Discharger must retain written documentation of the recommendation provided; or
- Certified by a nitrogen management plan specialist. Such specialists include Professional Soil Scientists, Professional Agronomists, Crop Advisers¹⁶ certified by the American Society of Agronomy, or Technical Service Providers certified in nutrient management in California by the ~~National Resource Conservation Service (NRCS)~~NRCS.

¹⁴ 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.

¹⁵ Harter, T., J. R. Lund, J. Darby, G. E. Fogg, R. Howitt, K. K. Jessoe, G. S. Pettygrove, J. F. Quinn, J. H. Viers, D. B. Boyle, H. E. Canada, N. DeLaMora, K. N. Dzurella, A. Fryjoff-Hung, A. D. Hollander, K. L. Honeycutt, M. W. Jenkins, V. B. Jensen, A. M. King, G. Kourakos, D. Liptzin, E. M. Lopez, M. M. Mayzelle, A. McNally, J. Medellin-Azuara, and T. S. Rosenstock. 2012. *Addressing Nitrate in California's Drinking Water with a Focus on Tulare Lake Basin and Salinas Valley Groundwater*. Report for the State Water Resources Control Board Report to the Legislature. Center for Watershed Sciences, University of California, Davis. 78 p. <http://groundwater-nitrate.ucdavis.edu>.

¹⁶ 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.

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- 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.

For Dischargers not within a high vulnerability groundwater area, nitrogen management plan certification is optional.

The Order requires that information on the nitrogen management plan be reported in each annual monitoring report (AMR) for Dischargers within high vulnerability areas. This will include confirmation that the Discharger is implementing the nitrogen management plan; the name and contact information of the certified specialist who prepared or approved the plan; a report of total nitrogen applied; and an estimate of crop nitrogen ~~need~~consumption.

The nitrogen management plan summary information contained in the AMR provides information on what was actually done the previous crop year, while the nitrogen management plan indicates what is planned for the upcoming crop year. Therefore, the first summary information is due the year following the implementation of the nitrogen management plan. This FWQP submission to the board and NMP reporting will provide the Central Valley Water Board with information regarding individual grower implementation of the Order’s requirements- (e.g., management practices implementation). Without this information, the board would rely primarily on surface and groundwater monitoring to determine compliance with water quality objectives- and farm management performance standards. FWQP submittal and nitrogen management reporting will provide assurance that growers are implementing practices and managing nutrients to protect surface and groundwater quality while monitoring data are collected. This information is also necessary to achieve consistency with the State Water Board’s Nonpoint Source Policy (NPS Policy). The NPS Policy requires that the board gather information on management practices as part of any nonpoint source program (ILRP is a nonpoint source program); see the section below titled “Non-point Source (NPS) Program” for more detailed discussion on the NPS Policy.

Plans and Reports

All approved and/or final reports or portions of reports that are not exempt from public disclosure in accordance with California law and regulations will be available for public inspection through Geotracker, the Central Valley Water Board Office, or the board’s website.

Water Quality Objectives

Surface water and groundwater receiving water limitations in section II 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* and the *Water Quality Control Plan for the Tulare Lake Basin* (Basin Plans). 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

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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 Plans 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 Plans also contain 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 Plans 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 Plans include 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 Plans state 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 and the Tulare Lake Basin Plan at page IV-21.00 contain implementation policies for application of water quality objectives that specify 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 (e.g., the Regional Water Board’s “Policy for Application of Water Quality

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Objectives”), or (3) an indicator parameter. For purposes of this Order, all three sources will be used as part of the process described below.

Water Quality Triggers

Implementation of numeric and narrative water quality objectives under the Order involves an iterative process. The appropriate water quality triggers for a particular irrigated agricultural operation covered under this Order depend on the beneficial uses of the water as designated in the Basin Plan(s) and the water quality objectives necessary to protect all beneficial uses of the water. Water quality triggers will be based on Basin Plan water quality objectives, which are sometimes site specific; and therefore do not apply generally across the entire Central Valley region. Consequently, this Order establishes a process for providing Dischargers with site-specific water quality triggers for surface water and groundwater. This process is initiated when the Discharger files a Notice of Intent (NOI) for coverage under this Order. The Executive Officer will review the NOI and may issue a Notice of Applicability (NOA), approving the Discharger’s coverage under this Order. The NOA will include the applicable beneficial uses, surface and groundwater water quality triggers, groundwater vulnerability designation, and any additional monitoring requirements based on review of the NOI. Additional monitoring requirements will include monitoring for compliance with any applicable Basin Plan TMDLs and associated load limits, as well as any additional groundwater monitoring requirements based on vulnerability status.

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.”¹⁷ The program goals and objectives include

¹⁷ 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.

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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 "Statement of Policy with Respect to Maintaining High Quality Waters in California (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 Report¹⁸ and evaluated in the Program Environmental Impact Report (PEIR)¹⁹ for the long-term ILRP. This Order requires each individual operation to develop a farm water quality plan that will describe ~~and evaluate~~ its management practices in place to protect surface water and groundwater quality. The MRP includes surface water monitoring to ~~evaluate and~~ verify proper implementation of management practices for surface water. For groundwater, the MRP requires the Discharger to evaluate whether its practices are protective of groundwater quality to verify proper implementation of management practices for groundwater – under the "management practices evaluation workplan." This Order also requires the development of surface water/groundwater ~~exceedance action~~ plans (~~SWEPs/GWEPs~~SWAPs/GWAPs) when there are exceedances of water quality objectives or trigger limits, monitoring results indicate a trend in degradation that may threaten applicable Basin Plan beneficial uses, and where groundwater management practices are found ineffective at achieving the Order's groundwater receiving water limitations under the management practices evaluation workplan: (i.e., not protective of groundwater quality). The requirements for ~~SWEPs~~SWAPs and ~~GWEPs~~GWAPs include that the Discharger identify and implement management practices to achieve water quality goals and continued monitoring to evaluate the effectiveness of such practices. The requirements of this Order are consistent with Key Element 2.
- (3) This Order requires the development of ~~SWEPs/GWEPs~~SWAPs/GWAPs where individual monitoring indicates that waste discharge exceeds a trigger level (~~SWEP~~) or the discharge may cause or contribute to an exceedance of a or water quality objective (~~GWEP~~) or where monitoring results indicate a trend in degradation that may threaten applicable Basin Plan beneficial uses (generally referred to as 'water quality problem'). Also, ~~GWEPs~~GWAPs are required where the management practices evaluation report concludes that groundwater management practices are not protective of groundwater quality. ~~SWEPs/GWEPs~~SWAPs/GWAPs must include time schedules for implementing the plans and meeting the surface and groundwater receiving water limitations (section II of the Order) as soon as practicable, but within a maximum of 10 years. The time schedules must be consistent with the requirements for time schedules set forth in this Order. The time

¹⁸ 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.

¹⁹ ICF International. 2011. *Irrigated Lands Regulatory Program - Program Environmental Impact Report*. Final and Draft. March. (ICF 05508.05.) Sacramento, CA. Prepared for Central Valley Regional Water Quality Control Board, Sacramento, CA.

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schedules must include quantifiable milestones that will be reviewed by the Executive Officer 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, management practices implementation, and evaluation of effectiveness of implemented practices. This feedback will allow iterative implementation of practices to ensure that program goals are achieved. The feedback mechanisms required by this Order are consistent with Key Element 4.
- (5) This Order establishes the following consequences where requirements are not met:
 - (a) The Discharger will be required, in an iterative process, to conduct additional monitoring and/or implement management practices when there are water quality problems;
 - (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 Dischargers 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)²⁰ 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 contained in Alternative 5 of the PEIR. Therefore, the actions by Dischargers to protect water quality in response to the requirements of this Order are expected to be similar to those described for Alternative 5 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, Dischargers will be required to implement water quality management practices to address water quality concerns. The PEIR describes and

²⁰ 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

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evaluates potential impacts of practices likely to be implemented to meet water quality and other management goals on irrigated lands. These water quality management practices include:

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

These practices are examples of the types of practices that would be broadly applied by irrigated agricultural operations throughout the Central Valley and are considered representative of the types of practices that would have potential environmental impacts. It is important to note that the evaluated practices are not required; operators will have the flexibility to select practices to meet water quality goals. This Order represents one order in a series of orders that will be developed, based on the alternatives evaluated in the PEIR for all irrigated agriculture within the Central Valley. The requirements of this Order would lead to implementation of the above practices within the Central Valley to a similar degree as is described for Alternative 5 analyzed in the PEIR. Also, the requirements of this Order may require installation of monitoring wells (with the extent depending on the number of Dischargers enrolled under this Order and whether they are within high vulnerability groundwater areas).

As described in the PEIR for Alternatives 5, 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

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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 Dischargers 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 to this Order, Monitoring and Reporting Program Order R5-2013-XXXX.

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; monitoring to evaluate whether waste discharges are meeting the Order’s receiving water limitations and performance standards; and implementation of improved practices when waste discharges may cause or contribute to a water quality problem- (e.g., exceedances of trigger levels, degradation trends are identified).

Initially, Dischargers will be required to develop a farm water quality plan to determine whether their practices are protective of water quality and whether they are meeting the established farm water quality management performance standards. Dischargers must also prepare and implement a nitrogen management plan as part of the farm water quality plan. Through the process of becoming aware of effective management practices; evaluating their practices; and implementing improved practices; Dischargers are expected to meet the farm water quality management performance standards and, thereby, achieve best practicable treatment or control (BPTC), where applicable. Implementation of the nitrogen management plan should result in achieving BPTC for nitrates discharged to groundwater.

Monitoring of surface water discharge and groundwater is required to evaluate whether waste discharges are meeting the Order’s receiving water limitations. Where individual monitoring indicates that waste discharges may cause or contribute to a water quality problem, the Discharger must prepare a surface/groundwater exceedanceaction plan. The plan must include the identification of practices that will be implemented to ensure waste discharge meets the Order’s receiving water limitations-and. Continued surface and groundwater monitoring will provide an evaluation of the effectiveness of those practices in addressing the water quality problem. This process will work to ensure that implementation of farm water quality plans and nitrogen management plans continue to result in achievement of BPTC, and that any degradation of high quality waters permitted under the Order will not cause or contribute to an exceedance of a water quality objective in receiving waters. Failure to implement practices

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associated with a surface or groundwater exceedanceaction plan may result in 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*

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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.²¹

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,”²² and 40 CFR 131.12 refers to “quality of waters [that] exceed levels necessary to support propagation of fish, shellfish, and wildlife and recreation.” Such waters are “high quality waters” under the state and federal antidegradation policies. In other words, high quality waters are waters with a background quality of better quality than that necessary to protect beneficial uses.²³ The

²¹ 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.

²² 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.

²³ 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.”

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.²⁴ However, if the decline in water quality was permitted consistent with state and federal antidegradation policies, the most recent water quality resulting from the 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); comparison of alternative methods of treatment or control, and/or consideration of methods currently used by the discharger or similarly situated dischargers.²⁵ The costs of the treatment or control should also be considered. Many of the above considerations are made under the “best efforts” approach

²⁴ 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.

²⁵ See *Questions and Answers, State Water Resources Control Board, Resolution 68-16* (February 16, 1995).

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described later in this section. In fact, the State Water Board has not distinguished between the level of treatment and control required under BPTC and what can be achieved through “best efforts.”

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

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

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

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

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

Waters that are Not High Quality: The “Best Efforts” Approach: Where a water body is not high quality and the antidegradation policies are accordingly not triggered, the Central Valley Water Board should, under State Water Board precedent, set limitations more stringent than the objectives set forth in the Basin Plan. The State Water Board has directed that, “where the constituent in a groundwater basin is already at or exceeding the water quality

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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 Central Valley to construct provisions in this Order to meet the substantive requirements of Resolution 68-16.

This Order potentially regulates discharges from thousands of individual fields to a very large number of water bodies within the Central Valley. 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.²⁶

However, data collected by the Central Valley Water Board, dischargers, educational institutions, and others demonstrate that many water bodies within the Central Valley are already impaired for various constituents that are or could be associated with irrigated agricultural activities. Those same data collection efforts also indicate that surface water bodies within the Central Valley meet objectives for particular constituents and would be considered “high quality waters” with respect to those constituents.

Similarly, ten percent of sampled wells in the Central Valley had a maximum nitrate level above applicable water quality objectives, and an additional 17 percent of wells had a maximum nitrate level between the water quality objective and half the objective.²⁷ However, it is unknown when

²⁶ Irrigated lands discharges have been regulated under a conditional waiver since 1982, but comprehensive data as to trends under the waiver are not available.

²⁷ State Water Board GAMA Program database, August 2012.

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the degradation occurred. While the lack of historical data prevents the board from being able to determine whether the groundwater represented by these wells are considered “high quality,”²⁸ 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 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’s provisions should also account for the fact that even where a water body is not high quality (such that discharge into that water body is not subject to the antidegradation policy), the board should, under State Water Board precedent, impose limitations more stringent than the objectives set forth in the Basin Plan, if those limits can be met by “best efforts.”

Consistency with BPTC and the “Best Efforts” Approach

Due to the numerous commodities being grown on irrigated agricultural lands and varying geological conditions within the Central Valley, 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 Report²⁹ (ECR) describes that there are numerous management practices that dischargers 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 performance standards combined with upfront evaluation, planning and

²⁸ As mentioned above, water quality data dating as far back as 1968 may be needed to determine whether such waters are considered “high quality” under Resolution 68-16.

²⁹ California Regional Water Quality Control Board, Central Valley Region, and Jones and Stokes. 2008. *Irrigated Lands Regulatory Program Existing Conditions Report*. Sacramento, CA.

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implementation of management practices to attain those goals, and 2) additional planning and implementation measures where individual discharger monitoring indicates that waste discharge may cause or contribute to a water quality problem. Taken together, these processes are considered BPTC/best efforts. The planning and implementation processes that growers must follow on their farms should lead to on-the-ground implementation of optimal practices and control measures to address waste discharge from irrigated agriculture.

1. Farm Water Quality Management Performance Standards

This Order establishes on-farm water quality performance standards for implementation of management practices that all Dischargers 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 Dischargers 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 needconsumption,
- e. prevent pollution and nuisance,
- f. achieve and maintain water quality objectives and beneficial uses, and
- 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”).³⁰ The agricultural management measures include practices and plans installed under various NPS programs in California, including

³⁰ *California’s Management Measures for Polluted Runoff*
(http://www.waterboards.ca.gov/water_issues/programs/nps/docs/cammpr/info.pdf)

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systems of practices commonly used and recommended by the USDA as components of resource management systems, water quality management plans, and agricultural waste management systems.

- USEPA’s National Management Measures to Control Nonpoint Source Pollution from Agriculture (EPA 841-B-03-004, July 2003;),³¹ “*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 water quality 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 Dischargers implement sediment discharge and erosion prevention practices to minimize or eliminate the discharge of sediment above background levels.

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 that nitrogen management plans be developed by all Dischargers. Nitrogen management plans require Dischargers to document how their fertilizer use management practices meet performance standard d. Finally, where nutrients may cause exceedances of water quality objectives in surface waters, this Order would require development of a detailed **SWEPSWAP** 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.

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³¹ (<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 Dischargers 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.

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 Dischargers to minimize waste discharge to surface and groundwater will lead to practices that will also achieve this management measure. For example, a Discharger 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 each Discharger develop a farm water quality plan (FWQP). Dischargers are encouraged to work with technical service organizations such as resource conservation districts and the University of California Cooperative Extension in the development of the entire plan. Working with technical service providers and specialists in the development of the FWQP will help to achieve education and outreach to all Dischargers regarding potential waste discharge and practices that may be implemented to achieve water quality goals.

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 Dischargers.

2. Additional Planning and Implementation Measures (SWEP/GWEPs/SWAP/GWAPs)
This Order requires development of water quality exceedanceaction plans (surface or groundwater) where individual water quality monitoring indicates that the discharge may cause or contribute to a water quality problem: (this includes situations where Discharger monitoring results indicate a trend in degradation that may threaten applicable Basin Plan beneficial uses).

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SWEPs/GWEPsSWAPs/GWAPs include requirements to investigate sources, and develop strategies to implement practices to ensure waste discharges are meeting the Order’s surface and groundwater limitations, Continued surface and groundwater monitoring is required to monitor the effectiveness of the exceedanceaction plan. In addition, Dischargers in high vulnerability groundwater areas are required evaluate whether implemented practices are protective of groundwater quality and achieve the Order’s groundwater receiving water limitation (management practices evaluation workplan). Under these plans, additional management practices will be evaluated and implemented in an iterative manner, to ensure that the management practices represent BPTC/best efforts and that waste discharge does not cause or contribute to degradation above water quality objectives. The SWEPs/GWEPsSWAPs/GWAPs and management practices evaluation workplans need to meet the performance standards set forth in this Order.

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 SWEPsSWAP or GWEPGWAP. For example, the Department of Pesticide Regulation (DPR) has established Groundwater Protection Areas 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...” Surface and groundwater exceedanceaction plans, referred to as SWEPs/GWEPs above, and associated surface and groundwater monitoring institute an iterative process whereby the effectiveness of any set of practices 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 Dischargers 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 unless individual water quality monitoring indicates that waste discharge may cause or contribute a water quality problem. Further, since BPTC determinations are informed by the consideration of costs, it is important that Dischargers not be subject to the more stringent and expensive requirements associated with SWEPs/GWEPsSWAPs/GWAPs when such measures are not needed to protect water quality.

Summary

Dischargers are required to implement practices to meet the above performance standards and

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periodically review the effectiveness of implemented practices and make improvements where necessary. Dischargers will identify the practices they are implementing to achieve water quality protection requirements as part of farm water quality plans, nitrogen management plans and SWEPs/GWEPs/SWAPs/GWAPs. Also, the Order requires water quality monitoring aimed to detect exceedances of water quality objectives and evaluate effectiveness of management practices (e.g., surface water discharge monitoring, management practices evaluation workplan).

Requirements for farm water quality plans, nitrogen management plans, SWEPs/GWEPs/SWAPs/GWAPs, and water quality monitoring are designed to ensure that degradation is minimized and that management practices are protective of water quality. These requirements will ensure that all Dischargers are implementing management practices that minimize degradation, the effectiveness of such practices is evaluated, and feedback monitoring is conducted to ensure that degradation does not threaten beneficial uses. Even in areas where there is no information indicating degradation of a high quality water, the farm water quality management performance standards act as a preventative requirement to ensure degradation does not occur. The farm water quality plans and nitrogen management plans provide indicators as to whether Dischargers are meeting applicable performance standards.

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 these goals. The Order relies on implementation of practices and treatment technologies that constitute BPTC/best efforts, and requires monitoring of water quality 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 not high quality. 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 those that are not.

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

- At a minimum, this Order requires that irrigated agriculture achieve and maintain compliance with water quality objectives and beneficial uses;
- The requirements implementing the Order will result in use of BPTC where irrigated agricultural waste discharges may cause degradation of high quality waters; where waters are already degraded, the requirements will result in the pollution controls that reflect the “best efforts” approach. Because BPTC will be implemented, any lowering of water quality will be accompanied by implementation of the most appropriate treatment or control technology;
- Central Valley communities depend on irrigated agriculture for employment (PEIR, Appendix A);
- 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

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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 imposes more stringent requirements in areas deemed “high vulnerability” based on threat to groundwater beneficial uses, including the domestic and municipal supply use. The Order also is designed to detect and address exceedances of water quality objectives, if they occur, in accordance with the compliance time schedules provided therein;

- Because the Order institutes requirements for all Dischargers that will reduce waste discharge levels (e.g., nitrogen management, performance standards), prohibits degradation above a water quality objective, and establishes surface water and groundwater monitoring programs to determine whether waste discharges are in compliance with the Order’s receiving water limitations, local communities should not incur any additional treatment costs associated with the degradation authorized by this Order. For example, reduced discharge of waste will work to reduce any degradation currently occurring and additional requirements associated with SWAPs/GWAPs will ensure discharge does not cause or contribute to exceedance of objectives. In situations where water bodies are already above water quality objectives and communities are currently incurring treatment costs to use the degraded water, the requirements established by this Order will institute requirements for reduction in waste discharge levels (nitrogen management/performance standards) and time schedules³² for further reductions in irrigated agricultural sources to achieve the Order’s receiving water limitations; therefore, this Order will, over time, work to reduce treatment costs of such communities; and
- The Order requires MembersDischargers to achieve farm water quality management practice performance standards and includes requirements to develop a farm management plan to ensure practices are implemented to achieve these standards. The iterative process whereby Dischargers implement practices to achieve farm management performance standards, coupled with surface and groundwater monitoring feedback to assess whether the practices are effective will preventminimize degradation of surface and groundwater quality and prevent any degradation above water quality objectives.

The requirements of the Order and the degradation that would be allowed are consistent with State Water Board Resolution 68-16. The requirements of the Order will result in the implementation of BPTC necessary to assure the highest water quality consistent with the maximum benefit to the people of the state. The receiving water limitations in section II of the Order, the compliance schedules in section X, and the Monitoring and Reporting Program’s requirements to track compliance with the Order, are designed to ensure that the 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

³² It is important to note that neither the Water Code, NPS Policy, or the Antidegradation Policy requires immediate compliance with water quality objectives. Time schedules are allowed under state law and policy. This Order establishes that any time schedules shall be as short as practicable. Because time schedules must be as short as practicable, they are consistent with the maximum benefit to the people of the state.

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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 average 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 \$~~148.55~~123.54 per acre greater than the cost associated with the protection of surface water only under the Coalition Group Conditional Waiver. The total average estimated cost of compliance associated with continuation of the previous Coalition Group Conditional Waiver within the entire Central Valley region is expected to be approximately \$60.76 per acre annually. The total estimated average cost of this Order is \$~~179.34~~184.29 per acre annually.³³

Approximately \$121.12 of the estimated \$~~179.34~~184.29 per acre annual average 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 Dischargers implement specific water quality management practices.³⁴ 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 Dischargers 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 Dischargers and those vendors or individuals providing services or equipment and not based on an estimate of those costs provided by the board.

In addition to the cost estimates associated with the implementation of management practices, the cost estimates include estimated permit fees that are charged to dischargers for permit coverage. In accordance with the State Water Board's Fee Regulations, the current annual permit fee charged to Dischargers covered by this Order ranges from \$300 to \$6,500, depending on the number of irrigated acres in the agricultural operation. The combined total estimated costs that include monitoring, reporting, and state fees are estimated to be \$~~58.19~~62.13 per acre annually (average).

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.

³³ The estimate is on a "per acre" basis because this Order is not the primary mechanism for irrigated agriculture to comply with the California Water Code for waste discharges. It is anticipated that the majority of irrigated agriculture will enroll in geographically-based third-party administered orders. The Central Valley Water Board does not know how many operations will enroll under this Order, but assumes that enrollment will be minimal.

³⁴ Per Water Code section 13360, the Central Valley Water Board may not specify the manner in which a Discharger complies with water quality requirements.

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This Order, which implements the long-term ILRP for dischargers not participating in a third-party group, is based on Alternative 5 of the PEIR. The Order contains the individual Central Valley Water Board administration, individual farm planning, individual surface and groundwater quality monitoring, and prioritized installation of groundwater monitoring wells similar to Alternative 5. Therefore, potential costs of the Order are estimated based on the costs given in the *Draft Technical Memorandum Concerning the Economic Analysis of the Irrigated Lands Regulatory Program* (Economics Report).³⁵ Table 2 summarizes the major regulatory elements of the Order and provides reference to the PEIR alternative basis.

The board administrative costs of the Order are estimated using the 2011-12 Annual Agricultural and Irrigated Lands Fee Schedule.³⁶ Farm planning costs are estimated to be similar to the costs shown for Alternative 5 for farm planning (Table 2-22, Economics Report) plus an additional annual cost for updating farm planning. Total surface water monitoring and reporting costs are based on the sampling costs shown in Table 2-10, Economics Report.³⁷ Total groundwater monitoring and reporting costs have been estimated based on sampling costs and the costs for installation of groundwater monitoring wells given in Tables 2-10 and 2-15, Economics Report, respectively.³⁸ Tracking costs of management practices and nutrients applied are estimated to be similar to the costs shown for Alternative 5 in Table 2-22 of the economics report –under “tracking.” Management practices costs have been estimated using Alternative 5 (Table 2-22, Economics Report). Estimated average annualized costs per acre of the Order relative to full implementation of the current waiver program in the Central Valley region are summarized below in Table 3.

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³⁵ 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

³⁶ California Code of Regulations, Title 23, section 2200.6.

³⁷ Additional costs have been estimated for sediment toxicity monitoring requirements. These costs are based on communication with laboratories that conduct such monitoring and costs for sample collection in the Economics Report (Table 2-10).

³⁸ Average cost figures were developed assuming that operations in high vulnerability groundwater areas would need to install and sample, on average, four monitoring wells.

Table 2. Summary of regulatory elements

Order elements	PEIR alternative basis
Central Valley Water Board administration	Alternative 5: individual enrollment with the board
Farm water quality plan (FQMP) Surface water exceedance action plan (SWEPSWAP) Groundwater exceedance action plan (GWEPGWAP)	Alternative 5: farm water quality management plan
Certification of nitrogen management plans	Alternative 5: certified nutrient management plans
Individual surface water monitoring	Alternative 5: individual tailwater and stormwater quality monitoring
Individual groundwater monitoring	Alternative 5: individual supply well and tile drainage monitoring and requirements to install and sample monitoring wells based on a prioritized system
Tracking of nitrogen	Alternative 5: individual tracking of all nutrients applied
Management practices implementation	Alternative 5: costs of management practice implementation

Table 3. Estimated annual average per acre cost of the Order relative to full implementation of the current program (PEIR Alternative 1)

	Order	Current program	Change
Administration	7.75	0.59	7.15
Farm plans	0.521.05	--	0.521.05
Monitoring/reporting/tracking	49.9254.38	0.86	49.0653.52
Management practices	121.12	59.31	61.81
Total	179.34184.29	60.76	118.55

* Totals may not sum due to rounding. Per acre costs have been developed using the estimated irrigated acres in the Central Valley region (est. 7,863,002, Table 3-3, Economics Report).

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

On 17 July 2012, the Sacramento and San Joaquin River Basin Plan and the Tulare Lake Basin Plan (Basin Plans) were amended to estimate 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 average cost of the irrigated lands program is \$216 million to \$1.3 billion, or \$27 to \$168 per acre.³⁹

³⁹ 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).

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The Order is not the primary mechanism for establishing regulations applicable to irrigated lands waste discharges. Unless there is a loss of third-party coverage, most, if not all operations will have the option to enroll under third-party implemented waste discharge requirements instead of the Order. Because third-party waste discharge requirements allow combining resources for monitoring and reporting, costs associated with compliance are much less than those estimated for the Order. Consequently, enrollment under the Order is expected to be minimal. Therefore, overall costs resulting from the Order are expected to be minimal, and will be dependent on the enrollment under the Order.

The average cost estimates in the Basin Plans are expressed as ranges applicable throughout the entire Central Valley. Because most growers will enroll under third-party orders, the overall cost of the irrigated lands program is better expressed as the costs under the third-party orders. For example, the board estimated the costs for the third-party order applicable to over 800,000 irrigated acres within Eastern San Joaquin River Watershed (Order R5-2012-0116) at approximately \$119 per acre annually (average). The costs of this Order will add a cost to the overall program; but because of the expected minimal enrollment, such costs are expected to be small in comparison with the overall cost of the ILRP. The total costs of this Order are therefore consistent with the overall cost range expressed in the Basin Plan even though per acre average costs of this Order exceed the range. In the unlikely event that third-party implemented orders were to broadly fail and this Order were implemented Central Valley-wide, the average annual total cost of this Order would be applicable Central Valley-wide; representing an approximate 69 percent increase from the high-end of the Basin Plan average annual cost estimate.

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 Basin Plans identify applicable beneficial uses of surface and groundwater within the Central Valley. This Order protects the beneficial uses identified in the Basin Plans. Applicable past, present, and probable future beneficial uses of Sacramento River Basin, San Joaquin River Basin, and Tulare Lake 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 Plans and applicable policies, rather than a site specific evaluation that might be appropriate for waste discharge requirements applicable to a single discharger.

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

Environmental characteristics of Central Valley waters 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

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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 exceedanceaction plans (SWEPs/GWEPsSWAPs/GWAPs) and through the management practices evaluation workplan process. 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. SWEPsSWAPs and GWEPsGWAPs must be designed to ensure that waste discharges from irrigated lands do not cause or contribute to an exceedance of a water quality objective and meet other applicable requirements of the Order, including, but not limited to, section II.

(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.

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

This Order establishes waste discharge requirements for irrigated lands in the Central Valley. 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 Central Valley region.

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