

CALIFORNIA ENVIRONMENTAL PROTECTION AGENCY
REGIONAL WATER QUALITY CONTROL BOARD
CENTRAL COAST REGION

Recommendations for Water Code Waiver
for Agricultural Discharges

Staff Report

*Report Proposing a Draft Agricultural Order
For Public Review and Comment*

November 2010





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LIST OF ACRONYMS/ABBREVIATIONS

ACL	Administrative Civil Liability
BAT	best available technology economically achievable
BCT	best practicable control technology currently achievable
BMP	best management practice
BPTC	best practicable treatment or control
CAC	County Agricultural Commissioner
CCR	California Code of Regulations
CDFA	California Department of Food and Agriculture
Central Coast Water Board	Central Coast Regional Water Quality Control Board
CEQA	California Environmental Quality Act
CFR	Code of Federal Regulations
DPR	California Department of Pesticide Regulation
ECR	Existing Conditions Report
EIR	Environmental Impact Report
FIFRA	Federal Insecticide, Fungicide, and Rodenticide Act
FWQMP	farm water quality management plan
GQMP	groundwater quality management plan
GWMP	(local existing) groundwater management plan
GWPA	groundwater protection areas (DPR)
GWPL	groundwater protection list (DPR)
MAA	Management Agency Agreement
MCL	maximum contaminant level
MDL	method detection limit
MEP	maximum extent practicable
MP	management practice
MRP	monitoring and reporting program
NMP	nutrient management plan
NPDES	National Pollutant Discharge Elimination System
NPS Policy	State Water Board Policy for Implementation and Enforcement of the Nonpoint Source Pollution Control Program
NPS	nonpoint source
PCPA	Pesticide Contamination Prevention Act
PEIR	Program Environmental Impact Report
PREC	Pesticide Regulation & Evaluation Committee (DPR)
PY	Personnel-year
RL	reporting limit
ROWD	report of waste discharge
State Water Board	State Water Resources Control Board
SVOC	semi-volatile organic compounds
SWAMP	Surface Water Ambient Monitoring Program
TMDL	Water Board Total Maximum Daily Load Program
TSS	total suspended solids
USDA	United States Department of Agriculture
USEPA	United States Environmental Protection Agency
USGS	United States Geological Survey
Waiver	conditional waiver of waste discharge requirements
Water Code	California Water Code
WDRs	waste discharge requirements
WIDB	DPR's well inventory database

µg/l

micrograms per liter

EXECUTIVE SUMMARY

Discharges of waste associated with agricultural discharges (e.g., pesticides, sediment, nutrients) are a major cause of water pollution in the Central Coast region. The water quality impairments are well documented, severe, and widespread. Nearly all beneficial uses of water are impacted, and agricultural discharges continue to contribute to already significantly impaired water quality and impose certain risks and significant costs to public health, drinking water supplies, aquatic life, and valued water resources.

The primary water quality issues associated with irrigated agriculture on the Central Coast Region are:

- Impacts to thousands of people who are drinking water contaminated with unsafe levels of nitrate or are drinking treated or replacement water to avoid drinking contaminated water. The cost to municipalities, communities, families, and individuals for treating drinking water polluted by nitrate is estimated to be in the hundreds of millions of dollars and the health impacts are serious- cancer, Parkinson's disease, Blue Baby Syndrome.
- Impacts to large stretches of rivers, creeks, and streams in the Central Coast Region's major watersheds that have been severely polluted by toxicity from pesticides, nutrients, and sediment. Agricultural discharges have caused some creeks to be found toxic (lethal to aquatic life) every time the site is sampled. As a result, these areas are often completely devoid of the aquatic life essential for a healthy functioning ecosystem. The pollution in some of these areas also creates conditions that are unsafe for recreation and fishing.

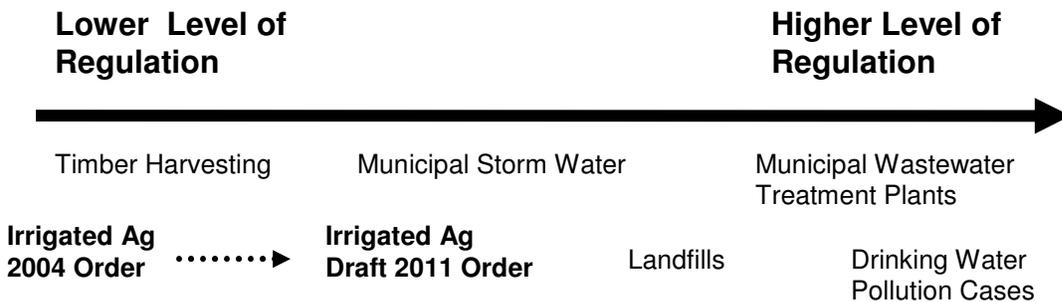
If the Central Coast Water Board and the regulated community do not adequately address the protection of water quality and beneficial uses, the environmental and health impacts are likely to become more severe and widespread. Similarly the costs are likely to increase significantly. The environmental, health and cost impacts threaten to significantly impact the future uses of the Central Coast's water resources.

The Central Coast Water Board adopted a Conditional Waiver of Waste Discharge Requirements for Discharges from Irrigated Lands in 2004 (2004 Conditional Waiver or 2004 Order), that has been renewed twice. The 2004 Order expires in March 2011. To address the water quality pollution, and to prevent further water quality impairment and impacts to beneficial uses caused by toxicity, nitrates, pesticides and sediment in agricultural runoff and leaching to groundwater associated with irrigated agriculture, the Central Coast Water Board will consider renewing the 2004 with revisions .

Water Board staff has prepared a Draft Conditional Waiver of Waste Discharge Requirements for Irrigated Agricultural Discharges (2011 Draft Order, to control these discharges. This proposed 2011 Draft Order will adjust the level or degree of regulation for agriculture to better match the degree of regulation compared to other Water Board programs based on the relative impacts to water quality. The diagram below, titled "Relative Degree of Water Board Regulation for Various Programs" illustrates that the Water Board's current regulation of irrigated agriculture (via the 2004 Order) is very low relative to other programs. This is the case even though the level of pollution discharged from irrigated agriculture and the resulting impacts to

beneficial uses are far greater than any other regulated activity. The draft 2011 Order increases the Water Board’s degree of regulation modestly compared to other programs.

Relative Degree of Water Board Regulation for Various Programs



The conditions proposed in the 2011 Draft Order were developed to address or be consistent with Water Board direction and public input.

The Water Board established the following water quality goals for the 2011 Draft Order:

- eliminate toxic discharges of agricultural pesticides to surface waters and groundwater;
- reduce nutrient discharges to surface waters to meet nutrient standards
- reduce nutrient discharges to groundwater to meet groundwater standards
- minimize sediment discharges from agricultural lands
- protect aquatic habitat

The Water Board also directed staff to make the 2011 Draft Order consistent with the following criteria:

- resolve water quality impairments associated with irrigated agriculture;
- comply with minimum statutory requirements; and
- include milestones, targets, and schedules for achieving water quality standards and protecting beneficial uses.

Staff also identified the following key concepts as important to stakeholders and Water Board members from review of stakeholder and Board member input:

- Prioritize based on water quality impacts and make protection of human health and drinking water the highest priority.
- “One size does not fit all.” Require more of those discharging the most, creating the greatest impacts, or most threatening water quality.
- Provide reasonable timeframes to control discharges and meet water quality goals.
- Require reasonable amount of implementation, monitoring and reporting requirements.

- Allow dischargers flexibility to comply with requirements based on uniqueness of individual operations.

Staff's recommendations address these issues as thoroughly as possible while meeting all regulatory and legal obligations for issuing an Order to control waste discharges from irrigated agricultural operations.

The 2011 Draft Order groups farm operations, or dischargers, into three tiers, each tier distinguished by four criteria that indicate threat to water quality: size of farm operation, proximity to an impaired watercourse, use of chemicals of concern, and type of crops grown. Dischargers with the highest threat have the greatest amount of discharge control conditions, individual monitoring, and reporting. Conversely, dischargers with the lowest threat have the least amount of discharger control conditions, individual monitoring, and reporting.

For example, the 2011 Draft Order proposes the following implementation and reporting requirements:

- Implement pesticide management practices to reduce toxicity in discharges so receiving waterbodies meet water quality standards;
- Implement nutrient management practices to eliminate or minimize nutrient and salt in discharges to surface water so receiving waterbodies meet water quality standards;
- Implement nutrient management practices to minimize fertilizer and nitrate loading to groundwater to meet nitrate loading targets ;
- Install and properly maintain back flow prevention devices for wells or pumps that apply fertilizers, pesticides, fumigants or other chemicals through an irrigation system;
- Implement erosion control and sediment management practices to reduce sediment in discharges so receiving water bodies meet water quality standards;
- Protect and manage existing aquatic habitat to prevent discharge of waste to waters of the State and protect the beneficial uses of these waters;
- Implement stormwater runoff and quality management practices.
- Develop, implement, and annually-update Farm Water Quality Management Plans.
- Submit an Annual Compliance Document (for higher threat dischargers) that includes individual discharge monitoring results, nitrate loading risk evaluation and, if nitrate loading risk is high, irrigation and nutrient management plan, verification of irrigation and nutrient management plan effectiveness.
- Submit a water quality buffer plan (for higher threat dischargers), if operations contain or are adjacent to a waterbody identified on the Clean Water Act section 303(d) List of Impaired Waterbodies as impaired for temperature or turbidity.

The Draft Monitoring and Reporting Program (Draft MRP) includes receiving water monitoring, individual surface water discharge monitoring, individual groundwater monitoring, and individual riparian and wetland photo-monitoring. The Draft MRP recommends that all dischargers in Tier 1, the lowest Tier, conduct the following monitoring:

- Receiving water monitoring- monthly and in cooperation with other dischargers, unless a discharger elects to do this individually (similar to the existing MRP)
- Groundwater monitoring- two times in one year during the five years of the Draft Order.

The Draft MRP recommends that all dischargers in Tier 2, conduct the following monitoring:

- Receiving water monitoring- same as above for Tier 1
- Groundwater monitoring- same as above for Tier 1

- Individual riparian and wetland photo-monitoring- once every three years and only for operations that contain or are adjacent to a waterbody impaired for temperature, turbidity, or sediment

The Draft MRP recommends that all dischargers in Tier 3, conduct the following monitoring

- Receiving water monitoring- same as above for Tiers 1 and 2
- Groundwater monitoring- quarterly for one year
- Individual riparian and wetland photo-monitoring- same as above for Tier 2
- Individual surface water discharge monitoring- four times each year for operations greater than 5000 acres and two times each year for operations between 1000 and 5000 acres for these parameters.
 - Flow measured or calculated in gallons per day
 - Nitrate concentration measured mg/L
 - Clarity measure turbidity NTUs

In developing this recommendation, staff considered and compared several options or alternatives to this Draft Order. These included the existing Order, the Preliminary Draft Order distributed February 1, 2010, three alternatives submitted April 1, 2010- one from the California Farm Bureau Federation and other agricultural groups, one from OSR Enterprises, Inc. and one from the Monterey Coastkeeper and other environmental groups. Staff also considered several different options for implementation, monitoring and reporting requirements within the 2011 Draft Order.

Water Board staff recommends the Central Coast Water Board adopt this Draft Order (after allowing public comment and responding) to require owners and operators of irrigated agricultural lands to achieve compliance with water quality standards and objectives in a timely manner with compliance verification monitoring. To achieve compliance with water quality standards and objectives, property owners and growers may have to implement effective management practices, treatment and control practices, and may have to change farming practices. This draft Order establishes accountability and transparency on behalf of the public and public resources.

I. INTRODUCTION

The Central Coast Water Board currently regulates discharges from irrigated lands with a Conditional Waiver of Waste Discharge Requirements (Order No. R3-2010-0040, hereafter referred to as the 2004 Order) that expires in March 2011. The Central Coast Water Board began a process in December 2008, to consider renewing the 2004 Order, including revising and adding conditions to more effectively reduce or eliminate discharges of waste associated with irrigated agriculture in the Central Coast Region (toxicity, pesticides, nutrients, sediment, impacts to drinking water, degradation of aquatic habitat).

There are numerous and varying irrigated agricultural operations within the Central Coast Region that have varying degrees of impact on water quality. . As indicated in a December 2008 letter to stakeholders, to directly address and resolve the major water quality issues associated with irrigated agriculture in the Central Coast region, staff is recommending a revised Order that includes the following:

- Clear articulation of water quality standards to ensure consistency with applicable Water Board plans and policies;
- Specific conditions to address water quality impairments;
- Milestones to measure progress;
- Time schedules to achieve compliance;
- Monitoring and reporting to verify compliance;

This report (1) summarizes the information Central Coast Water Board staff (staff) have considered in the development of a renewed Order, (2) describes the range of regulatory options considered, and (3) provides staff's recommendations for a revised Draft Order.

What is the Central Coast Water Board's regulatory role?

The Central Coast Water Board has the statutory responsibility to protect water quality and beneficial uses such as drinking water and aquatic life habitat. Any Order adopted by the Central Coast Water Board must be consistent with the California Water Code (Water Code) and Water Board plans and policies, including the Water Quality Control Plan for the Central Coast Region (Basin Plan). (Cal. Wat. Code § 13269) The Central Coast Water Board regulates discharges of waste to the region's surface water and groundwater to protect the beneficial uses of the water. In some cases, such as the discharge of nitrate to groundwater, the Water Board is the principle state agency with regulatory responsibility for coordination and control of water quality.. (Cal. Wat. Code §13001.)

Pursuant to the Porter-Cologne Water Quality Control Act (Wat. Code Div. 7), the Central Coast Water Board is required to regulate discharges of waste that could impact the quality of waters of the state. It can impose in orders, prohibitions on types of waste or location of discharges, requirements for discharging waste, and conditions on discharges of waste. The Water Board enforces violations of the prohibitions and requirements in these Orders. The Central Coast Water Board also develops water quality standards and implements plans and programs. These

activities are conducted to best protect the State's waters, recognizing the local differences in climate, topography, geology and hydrology.

The 2004 Order expires in March 2011. The Water Board will consider renewing the 2004 Order to revisions, including revised and new conditions to assure protection of waters of the state within the Region.

Among the highest priorities is to ensure that agricultural discharges do not continue to impair Central Coast communities' and residents' access to safe and reliable drinking water. This proposed Draft Order prioritizes those agricultural operations and areas of the Central Coast Region already known to have, or be at great risk for, severe water quality pollution. The proposed Draft Order would establish a known and reasonable time schedule, with clear and direct methods of verifying compliance and monitoring progress over time. The proposed Draft Order must enable the regulated community and stakeholders to understand when Dischargers are in compliance with requirements and successfully reducing their contribution to the water quality problems and maintaining adequate levels of water quality protection.

What is the issue?

Agricultural discharges are a major cause of water pollution in the Central Coast region. The water quality impairments are well documented, severe, and widespread. Nearly all beneficial uses of water are impacted, and agricultural discharges continue to contribute to already significantly impaired water quality and impose certain risk and significant costs to public health, drinking water supplies, aquatic life, and valued water resources.

The primary water quality issues associated with irrigated agriculture on the Central Coast are:

- Impacts to thousands of people who are drinking water contaminated with unsafe levels of nitrate or are drinking treated or replacement water to avoid drinking contaminated water. The cost to municipalities, communities, families, and individuals for treating drinking water polluted by nitrate is estimated to be in the hundreds of millions of dollars;
- Impacts to large stretches of rivers, creeks, and streams in the Central Coast region's major watersheds that have been severely polluted by toxicity from pesticides, nutrients, and sediment. Agricultural discharges have caused some creeks to be found toxic (lethal to aquatic life) every time the site is sampled (e.g., 2 times each year sampled for five years). As a result, these areas are often completely devoid of the aquatic life essential for a healthy functioning ecosystem. The pollution in these areas also creates conditions that are unsafe for recreation and fishing.

The Central Coast Water Board has the authority and responsibility to protect water quality and beneficial uses. The regulated community has the responsibility to comply with the Water Code. Failure to do so could result in costs and other impacts that are likely to increase significantly and severely limit the future of the Central Coast's water resources.

Why is the issue important?

Millions of Central Coast residents depend on groundwater for nearly all their drinking water from both deep municipal supply wells and shallow domestic wells. In addition, the Central

Coast Region's coastal and inland water resources are unique, special, and in some areas still of relatively high quality. The Region supports some of the most significant biodiversity of any temperate region in the world and is home to many sensitive natural habitats and species of special concern. Agricultural discharges continue to severely impact and threaten these resources and beneficial uses.

At the same time, the agricultural industry in the Central Coast Region is also one of the most productive and profitable agricultural regions in the nation, reflecting a gross production value of more than six billion dollars in 2008, contributing 14 percent of California's agricultural economy. For example, agriculture in Monterey County supplies 80 percent of the nation's lettuces and nearly the same percentage of artichokes and sustains an economy of 3.4 billion dollars.¹

Resolving agricultural water quality issues will greatly benefit public health, present and future drinking water supplies, aquatic life, recreational, aesthetic and other beneficial uses. Resolving agricultural water quality issues will also require changes in farming practices, will impose increasing costs to individual farmers and the agricultural industry at a time of competing demands on farm income, regulatory compliance efforts, and food safety challenges, and may impact the local economy. No industry or individual has a legal right to pollute and degrade water quality, while everyone has a legal right to clean water. Similar to all other Dischargers, the agricultural community is responsible for identifying, preventing and resolving pollution caused by irrigated agriculture and complying with water quality requirements.

Healthy watersheds and a sustainable agricultural economy can coexist. Protecting water quality and the environment while protecting agricultural benefits and interests will require change, and may shift who bears the costs and benefits of water quality protection. Continuing to operate in a mode that causes constant or increasingly severe receiving water problems is not a sustainable model.

2. STAFF RECOMMENDATION

The proposed Draft Order regulates discharges of waste from irrigated lands to ensure that such dischargers are not causing or contributing to exceedances of any Regional, State, or Federal numeric or narrative water quality standard, such that all beneficial uses are protected. The proposed Draft Order directly addresses agricultural discharges – especially contaminated irrigation runoff and percolation to groundwater causing toxicity, unsafe levels of nitrate, unsafe levels of pesticides, and excessive sediment in surface waters and/or groundwater. The proposed Draft Order also focuses on those areas of the Central Coast Region already known to have, or at great risk for, severe water quality impairment. In addition, the proposed Draft Order requires all dischargers to effectively implement management practices (related to irrigation, nutrient, pesticide and sediment management) that will most likely yield the greatest amount of water quality protection. The proposed Draft Order includes more stringent conditions to eliminate or minimize the most severe or impactful agricultural discharges and includes clear and direct methods and indicators for verifying compliance and monitoring progress over time. The proposed Draft Order also includes reasonable time schedules to eliminate or minimize degradation from all agricultural discharges.

Staff recognizes that the pollution caused by irrigated agriculture is significant and will not be resolved in a short time frame. Staff's priority in the short term is to take deliberate steps towards water quality improvement and eliminate or reduce agricultural discharges that load additional

¹ Salinas Valley Chamber of Commerce http://atlantabrain.com/ag_industry.asp

pollutants to water bodies and groundwater basins that are already polluted or at high risk of pollution.

Given the scale and severity of pollution in agricultural areas and the impacts to beneficial uses, including drinking water sources, staff recommends greater public transparency and Discharger accountability regarding on-farm discharges and individual compliance with requirements. Additionally, greater public transparency and discharger accountability will insure consistency with the State Policy for Implementation and Enforcement of the Nonpoint Source Pollution Control Program (NPS Policy).

Staff recommends that the Central Coast Water Board adopt this Draft Order to control discharges from irrigated lands. The rationale for this recommendation is summarized below and further explained in Sections 4 and 5 and the Appendices of this report.

The Draft Order is consistent with legal requirements and goals and criteria established by the Water Board for developing a revised or new Order (see Appendix I.). The Draft Order also incorporates input from members of the public representing the dischargers, environmental groups, environmental justice groups and many others (see Section 3.B).

In developing this recommendation, staff considered and compared several options or alternatives to this Draft Order (see Section 3.B). These included the existing 2004 Order, the Preliminary Draft Order distributed February 1, 2010, three alternatives submitted April 1, 2010- one from the California Farm Bureau Federation and other agricultural groups, one from OSR Enterprises, Inc. and one from the Monterey Coastkeeper and other environmental groups. Staff also considered several different options for implementation, monitoring and reporting requirements within the Draft Agricultural Order (see Section 2.D. and Appendix D).

Finally, staff developed this proposed Draft Order to address the documented severe and widespread water quality problems in the Central Coast Region, predominately unsafe levels of nitrate in ground water used for drinking water and toxicity decimating or impairing communities of aquatic organisms (see Section 3.E. and Appendix G).

Staff recommends that the Central Coast Water Board adopt proposed Order R3- 2011-0006.

3. PROPOSED DRAFT ORDER

A. SUMMARY OF PROPOSED DRAFT CONDITIONS, MONITORING AND REPORTING REQUIREMENTS

Water Board staff developed the recommendations for the Draft Order to be responsive to the issues raised by members of the public and Water Board members, and determined to be important through Water Board staff's evaluation of water quality conditions and options to control polluted discharges. Water Board staff attempted to address these issues as thoroughly as possible while meeting all regulatory and legal obligations for issuing an Order to control waste discharges from irrigated agricultural operations. The following discussion summarizes many, but not all, conditions of the Draft Order.

The Draft Order establishes three tiers of conditions based on threat to water quality. The Draft Order requires Dischargers to comply with conditions for the "tier" that applies to their operation. The tiers are based on four criteria that indicate threat to water quality: size of farm operation, proximity to an impaired watercourse, use of chemicals of concern, and type of crops grown. Dischargers with the highest threat have the greatest amount of discharge control requirements, monitoring and reporting. Conversely, dischargers with the lowest threat have the least amount of discharger control requirements, individual monitoring and reporting.

Dischargers fall into the Tiers as listed below if they meet the sets of criteria for that Tier as shown in the table below.

TIER 1	TIER 2	TIER 3
<p>does not use chlorpyrifos or diazinon</p> <p>AND</p>	<p>located within 1000 feet of impaired waterbody AND</p> <p>total irrigated acreage is less than 1000 acres AND</p> <p>does not use chlorpyrifos or diazinon;</p> <p>OR</p>	<p>total irrigated acreage greater than or equal to 1000 acres AND</p> <p>grows crops with high nitrate loading potential²</p> <p>OR</p>
<p>not located within 1000 feet of impaired waterbody¹</p> <p>AND</p>	<p>not located within 1000 feet of impaired waterbody AND</p> <p>total irrigated acreage is less than 1000 acres AND</p> <p>uses chlorpyrifos or diazinon;</p> <p>OR</p>	<p>total irrigated acreage greater than or equal to 1000 acres AND</p> <p>applies chlorpyrifos or diazinon</p> <p>OR</p>
<p>total irrigated acreage is not greater than 1000 acres, AND does not grow crops with high nitrate loading potential²</p>	<p>not located within 1000 feet of impaired waterbody AND</p> <p>total irrigated acreage is greater than or equal to 1000 acres AND</p> <p>does not grow crop with high nitrate loading potential²</p> <p>does not use chlorpyrifos or diazinon.</p>	<p>adjacent to a impaired waterbody¹ AND</p> <p>applies chlorpyrifos or diazinon</p>

1- listed for toxicity, pesticides, nutrients, or sediment on the Clean Water Act Section 303(d) List of Impaired Waterbodies

2- crop types with high potential to discharge nitrogen to groundwater, including: beet, broccoli, cabbage, cauliflower, celery, Chinese cabbage (Nappa), collard, endive, kale, leaks, lettuce (leaf and head), mustard, onion (dry and green), parsley, pepper (fruiting), spinach, and strawberry.

The conditions, monitoring and reporting requirements in the Draft Order are summarized in Table 2 below.

Table 1. Summary of Required Conditions, Monitoring and Reporting in the Draft Agricultural Order

CONDITIONS	Due in: ²
Pesticide Runoff/Toxicity Elimination	
All dischargers must implement management practices to eliminate or minimize toxicity and pesticide discharges so receiving water bodies meet water quality standards	immediately
Nutrient and Salt Management	
All dischargers must implement nutrient management practices to minimize nutrient and salt discharges so receiving water bodies meet water quality standards	immediately
All dischargers must minimize nutrient discharges from fertilizer and nitrate loading to groundwater so receiving water bodies meet water quality standards and safe drinking water is protected	immediately
Tier 3 dischargers must evaluate the nitrate loading risk factor (as high, medium or low) of their operations, annually	1 Yr
Tier 3 dischargers with a high nitrate loading risk must develop and initiate implementation of a certified Irrigation and Nutrient Management Plan (INMP) to meet specified nitrogen balance ratio targets	2 Yrs
Sediment Management / Erosion Control / Stormwater Management	
All dischargers must implement erosion control and sediment management practices to eliminate or minimize the discharge of sediments and turbidity so receiving water bodies meet water quality standards	3 Yrs
All dischargers must protect existing aquatic habitat (including perennial, intermittent, or ephemeral streams, lakes, and riparian and wetland area habitat or other waterbodies) to prevent discharges of waste so receiving water bodies meet water quality standards.	immediately
All dischargers must implement stormwater management practices to minimize stormwater runoff	immediately
Tier 2 and Tier 3 Dischargers must evaluate conditions of riparian and wetland habitat areas if their operations contain or are adjacent to a waterbody identified on the Clean Water Act Section 303(Dd) List of Impaired Waterbodies as impaired for temperature or turbidity.	1 Yr
Tier 3 dischargers must develop and initiate implementation of a Water Quality Buffer Plan to prevent waste discharge or water quality degradation, if their operations contain or are adjacent to a waterbody identified on the Clean Water Act Section 303(d) List of Impaired Waterbodies as impaired for sediment, temperature or turbidity and the discharger's runoff drains to that waterbody. The plan must include the following or the functional equivalent: minimum of 30 foot buffer; wider buffer if necessary to prevent discharge of waste; three zones with distinct types of vegetation (moving from area closest to waterbody to areas away from waterbody) to jointly provide shade, pollutant treatment through infiltration and reduced velocity of flow to promote sediment deposition; schedule for implementation; and maintenance provisions.	4 Yrs
General Groundwater Protection Requirements	
All dischargers that apply fertilizers, pesticides, fumigants or other chemicals through an irrigation system must have functional and properly maintained back flow prevention devices installed at the well or pump to prevent contamination of groundwater or surface water.	3 Yrs
All dischargers must properly destroy all abandoned groundwater wells, exploration holes or test holes, in such a manner that they will not produce water or act as a conduit for mixing or otherwise transfer groundwater or waste constituents between permeable zones or aquifers.	NA
All dischargers who choose to utilize containment structures (such as retention ponds or reservoirs) to achieve treatment or control of the discharge of wastes, must construct and maintain such containment structures to avoid percolation of waste to groundwater that causes or contributes to exceedances of water quality standards and to avoid surface water overflows that have the potential to impair water quality	NA
MONITORING	
All dischargers must sample private domestic and agricultural supply groundwater wells located at their operation, twice in one year	2Yrs
All dischargers must conduct watershed-scale (receiving water) monitoring as part of cooperative group or individually, monthly for five years	6 Months
Tier 2 and Tier 3 dischargers must photo-document existing conditions of riparian and wetland habitat areas, one time in five years, if their operation(s) contain or are adjacent to a waterbody identified on the Clean Water Act Section 303(d) List of Impaired Waterbodies as impaired for sediment, temperature or turbidity.	1 Yr

² Where specified time periods/deadlines are included in the proposed Order. NA = no time period specified in order.
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<i>Tier 3</i> dischargers must conduct individual discharge monitoring, two to four times per year for five years	6 months
REPORTING	
All dischargers must submit Notice of Intent to Enroll	60 days
All dischargers must submit results of groundwater sampling and related well information	6 Months
<i>Tier 2 and 3</i> dischargers must submit an Annual Compliance Document that includes status information on implementation of required conditions (e.g. implementation of management practices) and results of any required sampling or monitoring, appropriate for the tier applicable to the discharger's operation.	2 Yrs
<i>Tier 2 and Tier 3</i> dischargers must submit photo-documentation of conditions of riparian and wetland habitat areas with the Annual Compliance Document, <i>if their operation(s) contain or are adjacent to a waterbody identified on the Clean Water Act Section 303(d) List of Impaired Waterbodies as impaired for sediment, temperature or turbidity.</i>	1 yr
<i>Tier 3</i> dischargers must submit results of individual discharge monitoring	2 Yrs
<i>Tier 3</i> dischargers must submit results of evaluating nitrate loading risk factor (high, medium, or low)	1 Yr
<i>Tier 3</i> dischargers <i>with a high nitrate loading risk</i> must submit verification of Irrigation and Nutrient Management Plan (INMP) and other related nitrate loading and balance information	2 Yrs
<i>Tier 3</i> dischargers must submit Water Quality Buffer Plan to prevent waste discharge or water quality degradation, <i>if their operations contain or are adjacent to a waterbody identified on the Clean Water Act Section 303(d) List of Impaired Waterbodies as impaired for sediment, temperature or turbidity.</i>	4 Yrs

The Draft Order includes a requirement for Tier 2 and 3 Dischargers to submit an Annual Compliance Document. Some of the information required to be in this report includes the following:

For Tier 2 AND 3 Dischargers:

- Information describing individual operations (e.g., crop type, acreage, irrigation type, containment structures);
- Proof of proper backflow prevention devices;
- Proof of California Department of Fish and Game Streambed Alteration Agreements if required for work proposed in riparian areas; and
- Results of photo monitoring of existing riparian or wetland area habitat if operations contain or are adjacent to a waterbody identified on the Clean Water Act Section 303(d) List of Impaired Waterbodies as impaired for temperature or turbidity.

For Tier 3 Dischargers only:

- Evaluate Nitrate Loading Risk annually (see description below); and
- If Nitrate Loading Risk Factor is high,
 - Evaluate Nitrogen Budget parameters;
 - Develop and implement a certified irrigation and nutrient management plan (INMP);
 - Meet Nitrogen Balance ratio targets; and
 - Verify the overall effectiveness of the INMP in protecting groundwater quality and achieving water quality standards for nitrate.
- If operations contain or are adjacent to a waterbody identified on the Clean Water Act Section 303(d) List of Impaired Waterbodies as impaired for sediment, temperature or turbidity,
 - develop a water quality buffer plan (see description below) to prevent or reduce discharges of waste or submit evidence that discharge is controlled to prevent or reduce impacts associated with temperature or turbidity sufficient to attain water quality standards.
- Attain pesticide water quality standards in receiving waters associated with non-stormwater discharges within two years;

- Attain sediment and turbidity water quality standards in receiving waters associated with non-stormwater discharges within three years;
- Attain nutrients and salts water quality standards in receiving waters associated with non-stormwater discharges (not including subsurface drainage to tile drains) within four years.

Nitrate Loading Risk is a measure of the relative risk of loading nitrate to groundwater. The Nitrate Loading Risk Factor considers the Nitrate Hazard Index Rating (Delgado, et al. 2008) by crop type irrigation system type and irrigation water nitrate concentration for each ranch/farm. Dischargers with a high Nitrate Hazard Index Rating must evaluate Nitrogen budget parameters including: crop nitrogen uptake values, total nitrogen applied, nitrogen balance ration, estimate of nitrate loading to groundwater and estimate of reduction in nitrate loading to groundwater.

Water Quality Buffer Plans must include the following or the functional equivalent: minimum of 30 foot buffer; wider buffer if necessary to prevent discharge of waste; appropriate mix of vegetation to jointly provide shade, pollutant treatment through infiltration and reduced velocity of flow to promote sediment deposition; schedule for implementation; and maintenance provisions.

The Draft Order includes the following types of monitoring.

Receiving water monitoring, such as that currently done by the Cooperative Monitoring Program for Agriculture under the existing Order, is conducted in receiving waterbodies (e.g. streams, drains, estuaries), rather than directly in discharges. There are different types of receiving water monitoring, including long-term trend monitoring at fixed sites, follow-up monitoring for problem solving, and stormwater monitoring. Trend monitoring sites are typically monitored frequently enough (e.g. monthly) to show seasonal variability and to provide enough data to be able to show long-term trends over time (e.g. multiple years). They answer the question, “Is the water quality in this creek getting better?” Sites location is chosen to best represent water quality from areas of interest (e.g. a reach of stream draining an agricultural area), to integrate conditions over a broad length of a stream (e.g. at the bottom of a watershed), or to inform changes from an individual operation’s or small area’s discharge of pollutants into the receiving water body. Follow-up monitoring sites are sampled for a short “study” period, and allow additional questions to be answered about the trend data, such as better geographic isolation of problem areas, sources of problems, chemical cause of toxicity, etc. Stormwater monitoring is conducted during active storm events with the intent of capturing condition of water quality during runoff events, since some pollutants, like sediment and attached chemicals, move primarily during these events.

Overall, receiving water monitoring provides for long-term trend detection, status of water body conditions, spatial locations of water quality problems, and whether beneficial uses are being protected. This data can then inform staff decisions related to follow-up activities, 303(d) Listing, Total Maximum Daily Load development and compliance monitoring.

Individual discharge monitoring assesses the quality of discharges leaving individual farm operations and entering surface or ground waters. Individual discharge monitoring includes an initial characterization of surface and/or groundwater discharges. For continuous discharge there is ongoing monitoring to establish compliance and assess loading to receiving waters. This type of monitoring is generally intended to answer the question, “What is the quality of water and load of contaminants leaving this farm?” Individual discharge monitoring may include discharge characterization, surface discharge monitoring and groundwater monitoring. Individual surface discharge monitoring and Individual groundwater discharge monitoring are ongoing monitoring of

farm discharges to assess compliance with the Order that are required if the IDC shows that these discharges are present.

Individual Discharge Monitoring is proposed for some Dischargers to document compliance with conditions of the Order. Dischargers will sample to document pollutant source, load reductions, and achievement with water quality objectives. Individual Discharge Monitoring will also provide feedback to the dischargers to address pollutants found in the individual discharge. Individual discharge monitoring information may also be used to direct additional implementation, monitoring, and reporting as necessary to address problems. Individual discharge monitoring data may be used to inform inspection and enforcement activities. This type of monitoring would be used to verify the adequacy and effectiveness of the Order's implementation at the individual farm operation.

Groundwater monitoring will help characterize the groundwater conditions and allow prioritization of on-farm activities or regional areas based on groundwater conditions. Groundwater monitoring is proposed to assess groundwater conditions around farm operations, as this data is not currently collected. The frequency of sampling needed for groundwater, particularly for assessment purposes (as compared to tracking groundwater remediation progress) is less frequent than for surface water sampling. Groundwater well sampling is, typically quarterly for on-going groundwater quality characterization and to track changes and less frequently, such as annually, for simpler, broader characterization or indications of groundwater quality conditions.

Individual riparian and wetland habitat monitoring is a photographic assessment of habitat quality and extent on agricultural land, done on each farm adjacent to waterways. This type of monitoring is generally intended to answer the question, "What is the extent and quality of riparian and wetland habitat on this farm?" Each farm operation with a watercourse, wetland or waterbody would have to photo-document the physical conditions of existing water areas and associated riparian and wetland habitat. This information would help Water Board staff evaluate riparian and wetland habitat quality and ability to buffer or remove pollutants from entering a water course or remove them running into the water course. This type of monitoring provides a survey of physical conditions that do not usually change frequently so is only needed every few years.

The Draft Order proposes the following types of monitoring for Dischargers in each Tier as follows.

Tier 1: Receiving water monitoring and Groundwater monitoring

Tier 2: Receiving water monitoring, Individual groundwater monitoring, and Individual riparian and wetland photo-monitoring

Tier 3: Receiving water monitoring, Individual groundwater monitoring, Individual riparian and wetland photo-monitoring, and Individual surface water discharge monitoring

B. Summary of Draft Milestones and Time Schedule for Compliance

Table 3 describes the general time schedules for key compliance dates and milestones related to Order Conditions for all dischargers and Table 4 describes the same for Tier 2 and Tier 3 Dischargers. Dischargers must achieve compliance with requirements by dates specified. Milestones indicate progress towards compliance.

**Table 2. Time Schedule for Key Compliance Dates All Dischargers
(Tier 1, Tier 2, and Tier 3)**

REQUIREMENT	COMPLIANCE DATE ¹
Submit Notice of Intent (NOI)	Within 30 days of adoption of Order or Within 30 days acquiring ownership/ control, and prior to any discharge or commencement of activities that may cause discharge.
Submit Updated NOI	Within 30 days, upon change
Submit Notice of Termination	Immediately, when applicable
Implement best management practices, treatment or control measures, or change farming practices to achieve compliance with this Order.	Immediately
Protect existing aquatic habitat to prevent discharge of waste	Immediately
Submit Quality Assurance Project Plan and, Sampling And Analysis Plan, for receiving water quality monitoring	Within three months
Initiate receiving water quality monitoring	Within six months
Submit receiving water quality monitoring annual report	Within one year, and annually thereafter
Initiate sampling of groundwater wells	Within 12 months
Develop and Implement Farm Plan	Within 18 months
Complete 15 Hours Of Farm Water Quality Education	Within 18 months
Submit Groundwater Report	Within two years
Install and Maintain adequate backflow prevention devices.	Within three years

¹ General time schedules for key compliance dates and milestones related to Order Conditions. Dates are relative to adoption of this Order or enrollment date for Dischargers enrolled after the adoption of this Order, unless otherwise specified. Dischargers must achieve compliance for requirements by dates specified. Milestones indicate progress towards compliance.

Table 3. Additional Time Schedule for Key Compliance Dates for Tier 2 and Tier 3 Dischargers

REQUIREMENT	COMPLIANCE DATE ¹
Tier 2 and Tier 3:	
Submit Annual Compliance Document with all required reporting information as listed in MRP No. R3-2011-00XX)	October 1, 2012, and annually thereafter.
Conduct photo monitoring of riparian or wetland are habitat (if operation contains or is adjacent to a waterbody impaired for temperature, turbidity, or sediment)	October 1, 2012, and every 3 years thereafter
Report Nitrate Loading Risk level in Annual Compliance Document	October 1, 2012, and annually thereafter.
Report total nitrogen applied per acre, per crop in Annual Compliance Document (if discharge has High Nitrate Loading Risk)	October 1, 2014, and annually thereafter.
Only Tier 3:	
Submit Quality Assurance Project Plan and, Sampling And Analysis Plan, for Individual Discharge Monitoring	Within four months
Initiate individual discharge monitoring	Within six months
Determine Crop Nitrogen Uptake (if discharge has High Nitrate Loading Risk)	Within one year
Submit individual discharge monitoring annual report	Within two years, and annually thereafter
Develop Irrigation and Nutrient Management Plan (INMP) (if discharge has High Nitrate Loading Risk)	Within two years
Report INMP elements in Annual Compliance Document	October 1, 2014, and annually thereafter
Demonstrate that discharge is not causing or contributing to exceedances of pesticide or toxicity water quality standards in waters of the State or United States ² .	Within 2 years Milestones: Individual Discharge Monitoring indicates – 12 Months - one of two samples is not toxic. 24 Months - two of two samples is not toxic.
Achieve Nitrogen Balance Ratio target equal to one (1) for crops in annual rotation (e.g. cool season vegetables)	Within 3 years
Achieve Nitrogen Balance Ratio target equal to 1.2 for annual crops occupying the ground for the entire year (strawberries or raspberries)	
Demonstrate that discharge is not causing or contributing to exceedances of sediment and turbidity water quality standards in waters of the State or United States ² .	Within 3 years Milestones: Individual Discharge Monitoring indicates – 12 Months – Four samples collected. 24 Months – 75% reduction in turbidity / sediment load
Demonstrate that discharge (not including	Within 4 years

subsurface drainage to tiledrains) is not causing or contributing to exceedances of nutrient water quality standards in waters of the State or United States ² .	Milestones: Individual Discharge Monitoring indicates – 12 Months – Four samples collected 24 Months – 50% load reduction of measured nutrients in irrigation runoff 36 Months – 75% load reduction of measured nutrients in irrigation runoff
Submit Water Quality Buffer Plan	Within 4 years
Submit INMP Effectiveness Report (if discharge has High Nitrate Loading Risk)	Within 5 years
Demonstrate that discharge is not causing or contributing to exceedances of nitrate drinking water quality standards in groundwater ² .	Within 10 years Milestones: Years 3 – 5, Annual reduction in nitrogen loading to groundwater

1- General time schedules for key compliance dates and milestones related to Order Conditions. Dates are relative to adoption of this Order or enrollment date for Dischargers enrolled after the adoption of this Order, unless otherwise specified. Dischargers must achieve compliance for requirements by dates specified. Milestones indicate progress towards compliance.

2- Documentation may include data and information related to groundwater sampling, individual discharge monitoring, implementation of best management practices, treatment or control measures, or changes in farming practices to achieve compliance with this Order.

C. Summary of Options Considered

The options considered are discussed in Appendix D.

4. DEVELOPMENT OF THE DRAFT ORDER

A. February 2010 Preliminary Draft Order

Staff developed the preliminary recommendations for an Agricultural Order by building upon the 2004 Order to advance efforts to improve agricultural water quality and gain compliance with applicable water quality standards. Thus, staff recommended the same regulatory tool, a Conditional Waiver of Waste Discharge Requirements for Discharges from Irrigated Lands, to regulate agricultural discharges. To ensure understanding of applicable water quality standards, staff included explicit clarification of water quality discharge and compliance requirements. In addition, to improve implementation actions directly addressing the specific priority water quality issues, the Preliminary Draft Agricultural Order built upon the development and implementation of Farm Plans, including effective implementation of management practices (related to irrigation, nutrient, pesticide and sediment management) that will most likely yield the greatest amount of water quality protection. The Preliminary Draft Agricultural Order also built upon the existing Cooperative Monitoring Program by retaining watershed-scale, receiving water monitoring, but added individual monitoring and reporting to improve Water Board staff's ability to identify specific discharges loading pollutants or contributing to impacts, verify compliance with the requirements by dischargers and measure progress over time at the farm and watershed scales. The Preliminary Draft Agricultural Order focused on reducing or eliminating agricultural discharges – especially contaminated irrigation runoff and percolation to groundwater in the most severely impaired areas. Due to the unique conditions related to irrigated lands and individual farming operations, the Preliminary Draft Agricultural Order included multiple options for compliance to maximize Dischargers' flexibility in achieving desired water quality improvement according to a specific time schedule and specific milestones. Similar to the 2004 Conditional Waiver, the Preliminary Draft Agricultural Order also included significantly reduced monitoring and reporting requirements for those agricultural discharges identified as having relatively low-risk for water quality impairment. The conditions for compliance, the monitoring and reporting requirements and the time schedule for compliance are summarized in the following paragraphs.

Compliance Requirements

The Preliminary Draft Agricultural Order included the following requirements for dischargers to demonstrate compliance:

- Enroll to be covered by the Order
- Develop and implement a farm plan that includes management practices with certain conditions and specifications
- Eliminate non-storm water discharges, or use source control or treatment such that non-storm water discharges meet water quality standards
- Demonstrate through water quality monitoring that individual discharges meet certain basic water quality targets (that are or indicate water quality standards that protect beneficial uses). For example, non-storm water discharge monitoring should find:
 - No toxicity

- Nitrate \leq 10 mg/L NO₃ (N)
- Turbidity \leq 25 NTUs
- Un-ionized Ammonia $<$ 0.025 mg/L (N)
- Temperature \leq 68°F
- Demonstrate through water quality monitoring that receiving water is trending toward water quality standards that protect beneficial uses or is being maintained at existing levels for high quality water
- Farm operation must support a functional riparian system and associated beneficial uses (e.g., recreational uses like swimming, wading, or kayaking, fishing, wildlife habitat, etc.)

Monitoring and Reporting

Monitoring requirements were designed to support the implementation of the Preliminary Draft Agricultural Order (specifically as a Conditional Waiver of Waste Discharges). Monitoring must verify the adequacy and effectiveness of the Order's conditions. Monitoring information and data must be reported to the Water Board. The reporting requirements that staff recommended with the Preliminary Draft Agricultural Order included all farm operations to report on management practice implementation at the time of enrollment, to report on management practices at least once during the period of the Order, to update their farm plans annually with monitoring and site evaluation results, and to update their plans annually with specific adjustments in response to any results that indicate unacceptable progress (e.g., do not meet interim milestones set forth in the Order).

The current monitoring program for the 2004 Conditional Waiver uses a third party for meeting all monitoring and reporting requirements (Preservation, Inc., the nonprofit organization that implements the Cooperative Monitoring Program). Under the current monitoring and reporting program, Dischargers are responsible for monitoring and reporting either individually or collectively, and they must comply with the requirements of the Board-approved Monitoring and Reporting Program. The preliminary draft monitoring and reporting requirements provided for Dischargers to continue to use a third party as long as the third party is approved by the Executive Officer.

The existing monitoring program does not collect sufficient information regarding:

- Groundwater quality
- Pollution source identification
- Individual compliance
- Terrestrial riparian conditions

In the Preliminary Draft Agricultural Order, Water Board staff recommended a monitoring program that required four categories of monitoring: Individual Discharge Characterization Monitoring, Individual Discharge Monitoring, Watershed (receiving water) Monitoring, and Additional Monitoring if required by the Executive Officer (receiving water and/or discharge).

Staff recommended this monitoring program because it:

- Addresses all surface water (tailwater, tile drain water, stormwater, etc) and groundwater
- Provides complete identification of individual operations responsible for discharge
- Allows for immediate management of known discharges with the potential to impact water quality
- Limits costs for farms that are in compliance
- Prioritizes further regulatory action on farms that are not progressing toward compliance

- Uniformly distributes costs for trend and stormwater monitoring across all growers resulting in similar costs for all growers based on acreage farmed
- Provides data for surface and groundwater trends, individual compliance, management practice implementation, riparian protection, and stormwater
- Allows data collection, analysis, and reporting to be performed by a non-regulatory single third party
- Provides follow up monitoring to identify and mitigate known discharges with the potential to impact water quality

Proposed Time Schedule for Compliance

Water Board Staff considered a time schedule that would support timely and effective implementation. Under this Preliminary Draft Agricultural Order, either irrigation runoff would need to be eliminated within two years of adoption of the Order or the following pollutants in irrigation runoff would need to be eliminated and/or treated or controlled to meet applicable water quality standards by the dates specified:

- Toxicity – within two years of adoption of the Order
- Turbidity – within three years of adoption of the Order
- Nutrients – within four years of adoption of the Order
- Salts – within four years of adoption of the Order

Additionally, dischargers must implement management practices to reduce pollutant loading to groundwater.

Staff recommended the time-schedule in this Preliminary Draft Agricultural Order as a reasonable starting point to improve water quality. This schedule acknowledges that to fully control all discharges and achieve compliance will take longer than the five years of this Preliminary Draft Agricultural Order. In a separate, but related effort regarding regulation of agricultural discharges, staff is evaluating and developing a time schedule for actions and to meet interim milestones that extends out to 2025.

B. Results of Public Outreach

Workshop Outcomes

At the Workshop on May 12, 2010, staff presented a summary of water quality conditions, preliminary draft staff recommendations, and an evaluation of the alternatives submitted that concluded the agricultural alternatives did not meet the criteria set forth by the Board nor the water quality goals and requirements that staff established as necessary for a revised order when development of the 2011 Draft Order began prior to December 2008. See Table 5.

Table 4A. Evaluation of Alternatives based on Agricultural Order Requirements

Authority	Legal Requirement	Confirmation of Compliance	Point of Compliance	Milestone(s) to Measure Progress	Time to Compliance
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Porter-Cologne, Basin Plan	Eliminate toxic discharges of agricultural pesticides to surface waters and groundwater	<u>AG</u> : SMART sampling/ farm plan compliance document <u>OSR</u> : practice checklist <u>ENV</u> : On- farm and watershed scale monitoring and farm plan compliance document	None None Edge of farm; in stream	General Management Practice implementation General management practice implementation Specific requirements	None 5 years for education; 2 years for farm plan and checklist Timeframes found in preliminary draft order or shorter
Porter-Cologne, Basin Plan	Reduce nutrient discharges to surface waters to meet nutrient standards	<u>AG</u> : SMART sampling/ farm plan <u>OSR</u> : Compliance document/ practice checklist <u>ENV</u> : On- farm and watershed scale monitoring and farm plan compliance document	None None Edge of farm; in stream	General Management Practice implementation General management practice implementation Specific requirements	None 5 years for education; 2 years for farm plan and checklist Timeframes found in preliminary draft order or shorter
Porter-Cologne, Basin Plan	Reduce nutrient discharges to groundwater to meet groundwater standards	<u>AG</u> : none <u>OSR</u> : none <u>ENV</u> : On- farm and watershed scale monitoring and farm plan compliance document	None None Edge of farm; in stream	None None Specific requirements	None None Timeframes found in preliminary draft order, or shorter
Porter-Cologne, Basin Plan	Minimize sediment discharges from agricultural lands	<u>AG</u> : SMART sampling/ farm plan <u>OSR</u> : Compliance document/ practice checklist <u>ENV</u> : On- farm and watershed scale monitoring and farm plan compliance document	None None Edge of farm; in stream	General Management Practice implementation General management practice implementation Specific requirements	None 5 years for education; 2 years for farm plan and checklist Timeframes found in preliminary draft order or shorter

Authority	Legal Requirement	Confirmation of Compliance	Point of Compliance	Milestone(s) to Measure Progress	Time to Compliance
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Porter-Cologne, Basin Plan	Eliminate toxic discharges of agricultural pesticides to surface waters and groundwater	AG OSR ENV DRAFT CW	ENV DRAFT CW	AG OSR ENV DRAFT	OSR ENV DRAFT
Porter-Cologne, Basin Plan	Reduce nutrient discharges to surface waters to meet nutrient standards	AG OSR ENV DRAFT CW	ENV DRAFT CW	AG OSR ENV DRAFT	OSR ENV DRAFT
Porter-Cologne, Basin Plan	Reduce nutrient discharges to groundwater to meet groundwater standards	ENV DRAFT CW	ENV DRAFT	ENV DRAFT	ENV DRAFT
Porter-Cologne, Basin Plan	Minimize sediment discharges from agricultural lands	AG OSR ENV DRAFT CW	ENV DRAFT CW	AG OSR ENV DRAFT	OSR ENV DRAFT
Porter-Cologne, Basin Plan	Protect aquatic habitat	AG OSR ENV DRAFT CW	ENV DRAFT	ENV DRAFT	ENV DRAFT

Table 5 Continued: Evaluation of Alternatives based on Agricultural Requirements

¹Alternatives:

AG= CA Farm Bureau Federation and other Ag Organizations

OSR = OSR Enterprises, Inc.

ENV=Monterey Coast keeper and other Environmental Organizations

DRAFT= Draft Order released November 2010

CW= Existing 2004 Conditional Waiver for Irrigated Agriculture

²Requirements established as framework for development of Draft Ag Order in December 2008

The Board listened to public comments on the recommendations, and public presentations on proposed alternatives for regulating agricultural discharges. More than 375 members of the public attended the meeting and more than 80 individuals addressed the Water Board.

Proponents of alternatives to the Preliminary Draft Agricultural Order, California Farm Bureau Federation and local Farm Bureaus, Monterey Coastkeeper and partner environmental organizations, and OSR Enterprises, Inc, described their alternatives to the Board. Members of the public showed both support and opposition for the Order and commented on the following issues.

- Water quality conditions from agricultural discharges are severe, particularly nitrate contamination of drinking water;
- Costs to clean up the nitrate has been conveyed to communities that have been impacted by water pollution, in the form of increased health care costs, bottled water costs, and missing work;
- Implementation of the Order will be complex ,costly and infeasible;
- The Order timeline is aggressive;
- We have lost the collaborative process to develop the order;
- The Order needs strong numeric requirements, streamside buffers and riparian protections, and individual farm monitoring.
- The agricultural alternatives do not meet the criteria set forth by the Board.

Board members offered their own comments on what they heard at the Workshop and read in the staff reports and preliminary draft order. Some of the comments that Board members made, include:

- Tiered approach and phasing are essential; we need to focus on short term actions that address drinking water concerns. The worst areas should be addressed first.
- How do we coordinate with the food safety issues?
- Will there be enough staff to analyze all the information being requested from the Ag community?
- Will we be able to protect proprietary information requested in the farm plans?
- A required education element should be considered (15 hours in five years?).
- Need reasonable timelines.
- Individual Waste Discharge Requirements might have a role.
- There should be enforcement on the remaining growers that are not enrolled.
- Water quality issues identified are real and need to be addressed; consider prioritization of the issues.
- Perhaps the next waiver should look like a ten year plan and consider other components, and lay the framework at how we are going to get at all these issues.

Board members concluded that staff should move forward with next steps considering stakeholder and Board member input from the Workshop, meeting with stakeholders further and preparing a revised draft order. They also agreed to continue the Workshop at the July Board meeting in Watsonville.

On Thursday, July 8, 2010 the Water Board held a public workshop continuing the May 12 public workshop. Staff received 16 additional comment letters. These comments generally covered issues similar to the comments submitted prior to the May 12 Board Workshop and included:

General Support for Preliminary Draft Agricultural Order (over 880 letters including multiple copies of some form letters):

- Support for the process, the Agricultural Regulatory Program and preliminary draft recommendations for an updated Agricultural Order.
- Support for the prioritization of agricultural water quality and urges Central Coast Water Board to take timely actions to prevent further degradation.
- Support for the regulation of agricultural discharges to groundwater and the protection of drinking water sources.

- Support for requirements for individual groundwater monitoring, including private domestic wells and submittal of data and technical reports.

General Concern about Preliminary Draft Agricultural Order (over 200 letters):

- Requirements will result in economic hardship.
- Requirements will result in crop yield reductions and farmers will go out of business.
- The current process is inadequate, including California Environmental Quality Act (CEQA) requirements and specifically requirements to consider the social, environmental and economic impacts, and evaluate alternatives.
- Lack of cooperation with the growers and farm organizations to develop requirements.
- Objections to proposed aquatic habitat requirements.
- Objections to individual monitoring and reporting.

At the workshop, commenters presented the following issues and made the following comments:

- Advocacy for “SMART” sampling which is similar to the current confidential on-farm monitoring that the Cooperative Monitoring Program (CMP) conducts;
- Examples of ranchers who have adapted their practices and operations in response to SMART sampling to improve water quality;
- Expert presentations on technical hurdles of reducing nitrate loading to levels protective of water quality;
- Advocacy for individual discharger monitoring and riparian protection;
- Consideration of individual commodities (like strawberries);
- Need for flexibility;
- Need to evaluate technical feasibility of water quality improvements;
- Need for long timeframes;
- Include education requirements;
- Set reasonable and scientifically determined targets;
- Recognize benefits and challenges (costs and effectiveness) of riparian and vegetative buffers.
- agricultural alternatives do not meet the criteria set forth by the Board.

Board members made the following observations:

- Impacts to human health are the highest priority and need a short-term response;
- Build on original draft, and use good ideas heard at workshop;
- Support tiered approach and prioritizing where main problems are and based on commodities that are biggest risks;
- Consider recommendation to allow two years of private monitoring, and then require submittal of data and make it public;
- Focus on what staff can do in the next five years given reduced resources;
- Refine tiers beyond just impaired and unimpaired areas; also consider threats to water quality; find ways to tier requirements for groundwater impacts;
- Measure trends and hope to show improvements and meeting goals;
- No need for another workshop but anyone who wants to offer information to the Board should submit it or contact staff.

Public Outreach Meetings

Following the release of the draft report and supporting documents and continuing through September 2010, Water Board staff participated in several outreach meetings and events. To

ensure a diverse representation of stakeholders, staff initially made a deliberate effort to engage stakeholders who were not represented on the Ag Panel and who were not already actively participating in the process to renew the Agricultural Order, including technical assistance providers, municipalities, environmental justice organizations, and agricultural industry groups not yet involved. In addition to discussing potential conditions and alternatives, staff met with stakeholders to discuss water quality conditions and priorities, methods to outreach to underrepresented groups, technical considerations associated with achieving water quality standards, potential costs of compliance to agriculture and potential costs to communities impacted by agriculture. Staff also met specifically with representatives from agriculture and specific commodity groups.

Specific outreach meetings and events included the following (in Table 6):

Table 5. Agricultural Order Renewal Outreach Meetings and Event

Date	Meeting / Event
November 17, 2009	2009 Sustainable Ag Expo, sponsored by the Central Coast Vineyard Team
January 12, 2010	American Society of Agronomy, California Certified Crop Advisers
February 17, 2010	Monterey Coastkeeper
February 22, 2010	Santa Cruz County, Resource Conservation District of Santa Cruz County, and Big Sur Land Trust
March 3, 2010	San Luis Obispo County Water Resources Advisory Committee
March 8, 2010	Technical Assistance Providers (University of California Cooperative Extension, Cal Poly Irrigation Training Research Center, Monterey Bay National Marine Sanctuary, Natural Resources Conservation Service, Resource Conservation District of Monterey County)
March 9, 2010	Annual Monterey County Ag Expo – Presentation to Spanish speaking growers and irrigators
March 17, 2010	California Strawberry Commission
March 22, 2010	San Luis Obispo County Farm Bureau – North Coast Farm Center
March 23, 2010	The Commonwealth Scientific and Industrial Research Organisation (CSIRO) and Antinetti Consulting, Inc.
March 30, 2010	Central Coast Vineyard Team, Department of Pesticide Regulation, State Water Resources Control Board, Central Valley Regional Water Quality Control Board
April 11, 2010	Presentation to Association of California Water Agencies on Water Quality and Water Supply
April 14, 2010	Agricultural Water Quality Alliance (Monterey Bay National Marine Sanctuary, Resource Conservation District of Monterey County, Natural Resources Conservation Service, Central Coast Agricultural Water Quality Coalition, Central Coast Water Quality Preservation, Inc., Resource Conservation District of Monterey County, University of California Cooperative Extension, AWQA RCDs)
April 28, 2010	Interagency Meeting (U.S. Environmental Protection Agency, U.S. Fish and Wildlife, California Department of Public Health, California Department of Water Resources, California Department of Food and Agriculture, California Department of Fish and Game, California State Parks, County public health agencies, County Agriculture Commissioners)
April 29, 2010 (Pending)	Farm, Food Safety , Conservation Network
April 30, 2010	California Association of Nurseries and Garden Centers, University of

	California Cooperative Extension
May 24, 2010 (Pending)	Agriculture & Land-Based Training Association – Presentation to Spanish speaking growers “Programa Educativo Para Agricultores”
August 16, 2010	Multiple Agricultural Stakeholders: CA Farm Bureau Federation, County Farm Bureaus, Coalition, Grower-Shipper Association, Strawberry Commission, Central Coast Vineyard Team, and Other Agricultural Industry Representatives
August 16, 2010	Public Meeting: Scoping for California Environmental Quality Act
August 17, 2010	Environmental Defense Center, Monterey Coastkeeper, Surfrider, Santa Barbara Channelkeeper, Environmental Justice Coalition for Water
August 18, 2010	CA Association of Nurseries and Garden Centers, Nursery/Greenhouse Representatives
August 19, 2010	San Luis Obispo County Farm Bureau, Local Agricultural Representatives
September 8, 2010	Strawberry Commission
November 10, 2010	Board Member field trip to runoff treatment sites in Monterey County
November 15, 2010	Staff Presentation at Sustainable Ag Expo in Seaside, Monterey County

Changes in Response to Public Input

Staff changed the preliminary draft Agricultural Order based on feedback received from stakeholders and included the following changes in the 2011 Draft Order.

- removed conditions related to rainwater and containerized plants;
- clarified the intent to address irrigation runoff in the short term with immediate conditions vs. tiledrains in the long term;
- removed “tributaries” as a consideration for prioritizing farming operations in close proximity to impaired waterbodies for more stringent or immediate conditions;
- revised the table of high risk pesticides;
- revised aquatic habitat conditions;
- revised the level of prescription in conditions ;
- developed a compliance document for reporting instead of using the Farm Plan;
- included evaluations or milestones for pollutant loading in exchange, or in addition to, pollutant concentrations;
- evaluated and developed additional ways to define tiers of dischargers and associated conditions based on relative threat to water quality and apply the most stringent compliance requirements to highest threat tier;
- increased and staggered timeframes for compliance with various requirements;
- evaluated and developed additional options for monitoring and reporting that scale monitoring requirements so highest threat dischargers have more monitoring requirements than lower threat dischargers.

C. Summary of Public Comments on Draft Order

[NOTE TO READER: THIS IS PLACEHOLDER FOR A SUMMARY OF COMMENTS RECEIVED ON DRAFT ORDER AFTER NOVEMBER 19, 2010 WHEN THIS DRAFT STAFF REPORT PUBLISHED]

D. Summary of Environmental Setting and Water Quality Conditions

1. Water Resources on the Central Coast

The Central Coast Region's coastal and inland water resources are unique, special, and in some areas still of relatively high quality. Many Central Coast residents depend heavily on groundwater for drinking water from both deep municipal supply wells and shallow domestic wells. In addition, the region supports some of the most significant biodiversity of any temperate region in the world and is home to many sensitive natural habitats and species of special concern. These resources and the beneficial uses of the Central Coast water resources are severely impacted or threatened by agricultural discharges.

Thousands of people rely on public supply wells with unsafe levels of nitrate and other pollutants. Excessive nitrate concentration in drinking water is a significant public health issue resulting in risk to infants for methemoglobinemia or "blue baby syndrome", and adverse health effects (i.e., increased risk of non-Hodgkin's, diabetes, Parkinson's disease, Alzheimers, endocrine disruption, cancer of the organs) among adults as a result of long-term consumption exposure. Water Board staff estimate several additional thousands of people are drinking from shallow private domestic wells. Shallow groundwater is generally more directly susceptible to pollution from overlying land use. Groundwater quality data collection from shallow wells (especially agricultural or domestic drinking water wells) is not required and data is only broadly available, thus limiting evaluations related to potential public health risks and shorter term indications of water quality changes. For these wells, water quality is not regulated, not treated, or treated at significant cost to the well owner.

Agricultural discharges of fertilizer are the main source of nitrate contamination to groundwater based on local nitrate loading studies. In some cases, up to 30 percent of applied nitrogen may have leached to groundwater in the form of nitrate. Due to elevated concentrations of nitrate in groundwater, many public water supply systems have abandoned wells and established new wells or sources of drinking water, or are required to remove nitrate before delivery to the drinking water consumer, often, at significant cost.

Agricultural discharges have impaired surface water quality in the Central Coast Region, such that some creeks are found toxic (lethal to aquatic life) every time the site is sampled and as a result many areas are devoid of aquatic organisms essential to ecological systems. Vertebrates, including fish, rely on invertebrates as a food source. Consequently, invertebrates are key indicators of stream health, and are commonly used for toxicity analyses and assessments of overall habitat condition. The majority of creeks, rivers and estuaries in the Central Coast Region are not meeting water quality standards. Most of these waterbodies are impacted by agriculture. These conditions were determined and documented on the Central Coast Water Board's 2008 Clean Water Act Section 303(d) List of Impaired Waterbodies. The three main forms of pollution from agriculture are excessive runoff of pesticides and toxicity, nutrients, and sediments. In a statewide study, the Central Coast Region had the highest percentage of sites with pyrethroid pesticides detected and the highest percentage of sites exceeding toxicity limits. In addition, there are more than 46 waterbodies that exceed the nitrate water quality standard and several waterbodies routinely exceed the nitrate water quality standard by five-fold or more. In addition to causing the human health impacts discussed

previously, these high levels of nitrate are impacting sensitive fish species such as the threatened Steelhead, endangered Coho Salmon, by causing algae blooms that remove oxygen from water, creating conditions unsuitable for aquatic life.

The water quality conditions throughout the region are also impacting several other threatened and endangered species, including the marsh sandwort (*arenaria paludicola*), Gambel's watercress (*nasturtium rorippa gambelii*), California least tern (*sterna antillarum browni*), and red-legged frog (*Rana aurora*). The last remaining known populations of the two endangered plants, marsh sandwort and Gambel's watercress, occur in Oso Flaco Lake, are critically imperiled and depend upon the health of the Oso Flaco watershed to survive.

a. Summary of Groundwater Quality Conditions

To develop a comprehensive assessment of groundwater quality in agricultural areas throughout the Region, staff evaluated available groundwater data collected by the California Department of Water Resources, California Department of Public Health (CDPH), U.S. Geological Survey (USGS), State Water Resources Control Board (SWRCB) Groundwater Ambient Monitoring and Assessment (GAMA) Program, Lawrence Livermore National Laboratory (LLNL), local and county water resources agencies, and researchers. Although available groundwater quality data generally represent conditions at the groundwater basin and sub-basin scale, these data indicate widespread and severe nitrate impacts due to agricultural land uses over a broad scale given major portions of entire groundwater basins or aquifers are severely impacted with nitrate in areas subject to intensive irrigated agricultural activity. Groundwater quality data for the purposes of characterizing specific individual agricultural discharges are generally not available. However, a growing number of studies are available showing a direct link between irrigated agricultural practices and ongoing and significant nitrate loading to groundwater. In addition, numerous studies indicate nitrate in groundwater is the most significant water quality problem nationally, statewide and within the Region and that commercial fertilizer is the primary source of loading, particularly in areas of intensive agriculture.

The report contained within Appendix G focuses primarily on nitrogen/nitrate pollution. The report also refers to a more limited body of data that indicates irrigated agriculture is likely responsible for widespread leaching of salts and discharges of other chemicals such as pesticides with the potential to impact drinking water beneficial uses.

An evaluation of the sources of nitrogen, nitrogen loading to groundwater from irrigated agriculture and groundwater quality conditions is detailed in Appendix G to this staff report (with references cited) and summarized below.

Sources of Nitrogen Input and Loading Analyses -

- Fertilizer accounts for approximately 69 percent of the estimated available nitrogen input regionally of the three largest sources of nitrogen within the Region related to human activities (fertilizer, human waste and livestock waste).
- Approximately 83.6 percent of the estimated nitrogen loading to groundwater in the Salinas Valley is attributable to the commercial application of agricultural fertilizers.
- Approximately 45,404 tons of nitrogen were applied on average every year for agricultural purposes within the Region between 1998 and 2008.
- Over 17,000 tons of nitrogen (75,225 tons of nitrate) has been estimated to discharge/leach to groundwater on average every year for the last ten years from irrigated agriculture in the Region. This equates to an average groundwater loading of approximately 74 pounds of nitrogen (327.5 pounds of nitrate) per cropping acre of irrigated agriculture per year.

- For lettuce, nitrogen leachate concentrations of 104.9 to 178 mg/L nitrate-N were documented in a 2009 study in the Salinas Valley. These leachate concentrations are approximately 10 to 18 times the drinking water standard (using the federal standard convention of 10 mg/L nitrate-N for comparison) and would consequently require up to 18 times as much clean groundwater flowing under the site as the water percolating down from irrigation (volume of leachate) to dilute the water to the standard. And of course up gradient water is typically not “clean,” but also carries some nitrogen load. Based on 2008 and 2009 county Ag Commissioner cropping acre data, lettuce accounts for approximately 45 percent of the cropping acres in Monterey County and 38 percent in the Region. Lettuce typically requires less fertilizer-nitrogen application than the four other primary crops grown in the Region, strawberries, broccoli, cauliflower and celery.
- A 2005 report by LLNL indicates that nitrate impacts within the shallow aquifer of the Llagas subbasin are due to more recent fertilizer-nitrogen loading and not that of legacy farming practices or other sources. Groundwater ages in shallow aquifer wells east of Gilroy containing nitrate concentrations, exceeding twice the drinking water standard, were determined to be less than seven years old and in some locations less than two years old. Similarly, preliminary data from a 2010 LLNL special study indicated that shallow wells sampled in the Arroyo Seco area also had relatively “young” groundwater- about five years old.
- The potentially significant loading of salts to groundwater from irrigated agriculture warrants the collection and analysis of groundwater quality data for salt constituents and metrics of salinity within and around agricultural areas.

Nitrate Impacts to Groundwater Beneficial Uses -

- 55 percent of the drinking water standard violations in public supply wells (for water systems with fifteen or more service connections) in the Central Coast Region were attributable to nitrate (data from Department of Water Resources).
- Approximately 9.4 percent of all public water supply wells in the Region had concentrations of nitrate in excess of the drinking water standard between 1994 and 2000.
- 18 percent of public supply wells within the Salinas Valley groundwater basin (excluding the Paso Robles subbasin), contained nitrate in excess of the drinking water standard during the period between 1979 and 2009. Excluding the Seaside, Langley and Corral de Tierra subbasins of the Salinas Valley groundwater basin that are not as intensively farmed but are subject to greater potential nitrogen loading from septic systems, the number of wells containing nitrate in excess of the drinking water standard increased to 23 percent. Approximately 37 percent of the public supply wells in the Salinas Valley contained nitrate concentrations between background levels and the drinking water standard.
- 27 percent of public supply wells in the Santa Maria groundwater basin contained nitrate in excess of the drinking water standard. 40 percent of the wells contained nitrate concentrations between background levels and the drinking water standard.
- 19 percent of the small water supply system (with two to 14 service connections) wells sampled in Monterey County exceeded the nitrate drinking water standard and 44 percent contained nitrate concentrations between background levels and the drinking water standard during the 2008-2009 fiscal year.
- 55.3 percent of the 508 domestic wells sampled in the Llagas subbasin had concentrations of nitrate in excess of the drinking water standard at levels and up to 4.5 times the drinking water standard, as well as average and median nitrate concentrations just above the drinking water standard during a voluntary nitrate sampling program conducted in 1998. Comparison of the 1998 domestic well data with three previous domestic well studies indicated that average nitrate concentrations within domestic wells in the Llagas subbasin increased steadily from 19.5 mg/L nitrate-NO₃ in 1963 to 47.7 mg/L nitrate-NO₃ in 1998. The relative

percentage of wells with nitrate in excess of the drinking water standard increased from 11.3 to 55.3 percent in the Llagas subbasin during this time period.

Pesticide in Groundwater-

- 6.9 percent of wells sampled in the Region contained pesticides, although numerous well sampling data collected by DPR between 1984 and 2009 indicated pesticides are infrequently detected above preliminary health goals or drinking water standards.

b. Summary of Surface Water Quality Conditions

Surface water bodies throughout the region are degraded as evidenced by high levels of nitrates and consistent toxicity measurements. The highest nitrate concentrations and most severe toxicity occur in agricultural watersheds.

To determine surface water conditions, staff reviewed data collected by CMP and CCAMP, and conducted a review of other water quality available water quality information, for marine areas for example, in the Central Coast Region.

Surface water conditions are detailed in Attachment 1 to this staff report and summarized below.

Indicators of Surface Water Quality Impairment-

- Most of the same areas that showed serious contamination from agricultural pollutants five years ago are still seriously contaminated.
- The proposed 2010 Clean Water Act Section 303(d) List of Impaired Waters for the Central Coast Region (Impaired Waters List) identifies surface water impairments for approximately 167 water quality limited segments related to a variety of pollutants (e.g., salts, nutrients, pesticides/toxicity, and sediment/turbidity). Sixty percent of the surface water listings identified agriculture as one of the potential sources of water quality impairment.
- Agricultural discharges most severely affect surface waterbodies in the lower Salinas and Santa Maria watersheds, both areas of intensive agricultural activity. Evaluated through a multi-metric index of water quality, 82 percent of the most degraded sites in the Central Coast Region are in these agricultural areas.
- Nitrate concentrations in areas that are most heavily impacted are not improving significantly or in any widespread manner and in a number of sites in the lower Salinas/Tembladero and Santa Maria watershed areas appear to be getting worse in the last few years (from CCAMP and CMP data) .
- Thirty percent of all sites from CCAMP and CMP have average nitrate concentrations that exceed the drinking water standard, and approximately 60 percent exceed the level identified to protect aquatic life. Several of these water bodies have average nitrate concentrations that exceed the drinking water standard by five-fold or more. Some of the most seriously polluted waterbodies include the Tembladero Slough system (including Old Salinas River, Alisal Creek, Alisal Slough, Espinosa Slough, Gabilan Creek and Natividad Creek), the Pajaro River (including Llagas Creek, San Juan Creek, and Furlong Creek), the lower Salinas River (including Quail Creek, Chualar Creek and Blanco Drain), the lower Santa Maria River (including Orcutt-Soloman Creek, Green Valley Creek, and Bradley Channel), and the Oso Flaco watershed (including Oso Flaco Lake, Oso Flaco Creek, and Little Oso Flaco Creek).

- Toxicity is widespread in Central Coast waters, with 65 percent of all waterbodies monitored for toxicity showing some measure of lethal effect. Twenty-nine waterbodies are on the proposed 2010 Clean Water Act, Section 303(d) List of Impaired Waters because of sediment and/or water toxicity.
- Ninety percent of severely toxic sites are in agricultural areas of the lower Santa Maria and Salinas/Tembladero watershed areas.
- Discharges from a number of agricultural drains have shown toxicity nearly every time the drains are sampled. Researchers collaborating with CCAMP have shown that these toxic discharges can cause toxic effects in river systems that damage benthic invertebrate communities.
- Water column invertebrate toxicity is primarily associated with high concentrations of diazinon and chlorpyrifos pesticides; sediment toxicity is likely caused by chlorpyrifos and pyrethroid pesticide mixtures.
- Agricultural use of pyrethroid pesticides in the Central Coast Region and associated toxicity are among the highest in the state. In a statewide study of four agricultural areas conducted by the Department of Pesticide Regulation (DPR), the Salinas study area had the highest percent of surface water sites with pyrethroid pesticides detected (85 percent), the highest percent of sites that exceeded levels expected to be toxic (42 percent), and the highest rate (by three-fold) of active ingredients applied (113 lbs/acre).
- Agricultural discharges contribute to sustained turbidity with many sites heavily influenced by agricultural discharges exceeding 100 NTUs as a median value. For comparison, most CCAMP sites have a median turbidity level of under 5 NTUs. Resulting turbidity greatly exceeds levels that impact the ability of salmonids to feed. Many of these more turbid sites are located in the lower Santa Maria and Salinas-Tembladero watersheds.
- Lack of shading in creek channels modified for agricultural purposes can cause water temperatures to exceed levels that are healthy for salmonids. Several high temperature areas are in major river corridors that provide rearing and/or migration habitat for salmonids. These include the Salinas, Santa Maria, and Santa Ynez rivers.
- Bioassessment data shows that creeks in areas of intensive agricultural activity have impaired benthic communities. Aquatic habitat is often poorly shaded, high in temperature, and has in-stream substrate heavily covered with sediment.
- Several Marine Protected Areas (MPAs) along the Central Coast are at risk of pollution impacts from sediment and water discharges leaving river mouths. Three of the MPAs, Elkhorn Slough, Moro Cojo Slough and Morro Bay, are estuaries that receive runoff into relatively enclosed systems. In two of these MPAs (Moro Cojo Slough and Elkhorn Slough), nitrates, pesticides and toxicity are documented problems.
- Research in the Monterey Bay area has shown that discharge of nitrate from the Salinas and Pajaro river systems can increase the initiation and development of phytoplankton blooms, and some of these blooms have resulted in the deaths of hundreds of sea birds.

Indicators of Surface Water Quality Trends -

- Some drainages in the Santa Barbara area are improving in nitrate concentrations (such as Bell Creek, which supports agricultural activities) and on Pacheco Creek in the Pajaro watershed. A number of locations in the lower Salinas and Santa Maria areas show increasing nitrate concentrations over the past five years of the CMP. However, flow volumes have declined at some of these sites, so at these locations nitrate loads may not necessarily be getting worse in spite of upward trends in concentrations;

- Dry season flow volume is declining in some areas of intensive agriculture, implying reductions in tailwater volume;
- Detailed flow analysis by the CMP showed that 18 of 27 sites in the lower Salinas and Santa Maria watersheds had statistically significant decreases in dry season flow over the first five years of the program;
- CCAMP monitoring has detected declining flows at other sites elsewhere in the Region, likely because of drought;
- Several sites along the main stem of the Salinas River showed significant increases in turbidity during the dry season; significant decreases in turbidity were seen at two locations in the Santa Maria watershed.
- One CCAMP monitoring site on the Salinas Reclamation Canal (309JON) shows statistically significant improvement in survival of invertebrate test organisms in water.

Surface Water Quality Data and Information Gaps -

- The timeframe and frequency of data collection, especially for toxicity, limit the evaluation of statistical trends for some water quality parameters in surface waterbodies;
- In-stream water quality is an effective long-term measure of water quality improvement (especially for nutrients), and more time may be necessary in some locations to identify significant change.
- In-stream water quality monitoring data is necessary to show compliance with Total Maximum Daily Loads and to list or delist waterbodies from the Clean Water Act, Section 303(d) List of Impaired Waters. These are both key Water Board management tools.
- Flow information and water quality data are not reported for agricultural discharges from individual farms, so correlations cannot be made between reductions in irrigation runoff or improvements in agricultural discharge quality and in-stream changes.
- Because there is no individual on-farm monitoring or reporting, it is unknown how individual farms contribute to surface water quality improvement or impairment. In addition, it is unknown if individual Dischargers are in compliance with water quality standards (given the magnitude and scale of documented impacts, it is highly likely that most discharges are not in compliance).
- In Marine Protected Areas, there is no monitoring of sediments that carry pesticides in attached forms. Without this information it is difficult to determine if these pesticides, carried downstream attached to sediments and discharged to the ocean, harm marine life.
- Additional research could increase understanding of the impacts of nutrient discharges from rivers to nearshore ocean waters.

c. Summary of Aquatic Habitat Conditions

Aquatic habitat is degraded in many areas of the region as evidenced by poor biological and physical conditions. Most surface waterbodies in agricultural watersheds are not suitable for safe recreational fishing or to support aquatic life.

To determine aquatic habitat conditions, staff reviewed data collected by CMP and CCAMP, and conducted a review of available riparian and wetland information for the Central Coast Region. While the 2004 Conditional Waiver did not specifically require aquatic habitat monitoring, it stated that cooperative monitoring of in-stream effects would enable the Central Coast Water Board to assess the overall impact of agricultural discharges to beneficial uses, such as aquatic life and habitat. The 2004 Conditional Waiver also requires protection of beneficial uses including aquatic

and wildlife habitat. The proposed 2010 order continues that requirement.

Aquatic habitat conditions are detailed in Attachment 1 to this staff report and summarized below.

Indicators of Aquatic Habitat Degradation -

- Agricultural activities result in the alteration of riparian and wetland areas, and continue to degrade the waters of the State and associated beneficial uses. Owners and operators of agricultural operations historically removed riparian and wetland areas to plant cultivated crops and in many areas continue to do so.
- As a result of riparian and wetland habitat degradation, watershed functions that serve to maintain high water quality, aquatic habitat and wildlife - by filtering pollutants, providing shade and protection from predators, recharging aquifers, providing flood storage capacity, have been disrupted.
- Data collected from CCAMP and CMP indicate that population characteristics of aquatic insects (benthic macroinvertebrates) important to ecological systems reflect poor water quality, degradation or lack of aquatic habitat, and poor overall watershed health at sites in areas with heavy agricultural land use. Aquatic habitat is often poorly shaded, high in temperature, and stream bottoms are heavily covered with sediment.
- The lower Salinas watershed and lower Santa Maria watersheds score low for common measures of benthic macroinvertebrate community health and aquatic habitat health.
- Unstable, bare dirt and tilled soils, highly vulnerable to erosion and stormwater runoff, are common directly adjacent to surface waterbodies in agricultural areas. Erosion and stormwater runoff from agricultural lands contribute sediment and sustained turbidity at levels that impact the ability of salmonids to feed. Many of these sites are located in the lower Santa Maria and Salinas-Tembladero watersheds.
- Degradation of aquatic habitat also results in water temperatures that exceed levels that are desirable for salmonids at some sites in areas dominated by agricultural activity. Several of these sites are in major river corridors that provide rearing and/or migration habitat for salmonids. These include the Salinas, Santa Maria, and Santa Ynez rivers.
- Real and/or perceived incompatible demands between food safety and environmental protection and subsequent actions taken by Dischargers to address food safety concerns associated with environmental features have resulted in the removal of aquatic habitat and related management practices.
- According to a Spring 2007 survey by the Resource Conservation District of Monterey County (RCDMC), 19 percent of 181 respondents said that their buyers or auditors had suggested they remove non-crop vegetation from their ranches. In response to pressures by auditors and/or buyers, approximately 15 percent of all growers surveyed indicated that they had removed or discontinued use of previously adopted management practices used for water quality protection. Grassed waterways, filter or buffer strips, and trees or shrubs were among the management practices removed (some were grant funded –right?).

Indicators of Aquatic Habitat Improvements -

- Riparian areas can improve water quality by trapping sediment and other pollutants contained in terrestrial runoff (NRC 2002; Flosi and others 1998; Pierce's Disease/Riparian Habitat Workgroup PDRHW 2000; Palone and Todd 1998). intact riparian area helps decrease rate of water flow, stores floodwaters, and dissipates stream energy, increasing infiltration (Palone and Todd 1998).
- The Watershed Institute Division of Science & Environmental Policy at California State University Monterey Bay implemented wetland restoration projects in the Gabilan

Watershed and surrounding Southern Monterey Bay Watersheds. These projects increased plant and bird populations and improved water quality (removed sediment, nitrate and pesticides loading to waterbodies).

- Coastal Conservation and Research and Moss Landing Marine Laboratories implemented restoration projects in the Moro Cojo Slough. These projects reduced nitrate levels in runoff, increased plants and vertebrates populations, and supported endangered species.
- The Watershed Institute at California State University Monterey Bay and Moss Landing Marine Laboratories studied changes in stream turbidity in restoration sites in the Hansen Slough area near Watsonville. The study concluded that stream turbidity decreased by more than 50-fold and nitrate concentrations in water flowing through decreased from levels at and above 140 mg/L to levels between 5 mg/L and 40 mg/L.

d. Waste Discharges from Irrigated Agricultural Lands

Water quality of agricultural discharges is often poor, carrying nitrates at concentrations above safe drinking water levels and pesticides at concentrations above toxic levels to waterbodies in the region. Agricultural discharges contribute significantly to water quality conditions. In some cases, agricultural discharges are the sole or primary source of pollution in impaired waterbodies. Even in areas where agricultural is not the only source of pollution, it is a primary contributor.

Numerous studies document the impact of agricultural discharges on water quality and specific pollutants contained in irrigation runoff. Research conducted by the Food and Agriculture Organization of the United Nations found that irrigation return flow resulted in a significant increase in nitrogen, phosphorous, pesticide residues, and sediments.

Agricultural research conducted by University of California Cooperative Extension (UCCE) found nitrate values in agricultural tailwater at 26, 53, and 75 mg/L NO₃-N (up to 7.5 times the drinking water standard). UCCE researchers indicated that the high levels of nitrate at the site were likely caused by the grower injecting nitrogen fertilizer into the irrigation water during the 2nd and 3rd irrigation events. A UC Davis study of Salinas Valley farms found that by the second and third crop cycles, farm soils had begun to accumulate nitrogen, but that growers continued with the same fertilization schedule. In addition, soils are high enough in phosphorus that in some areas no added phosphorus is necessary; however, growers continue to add this chemical to their fields. These practices lead to excess fertilizer leaving the farm, which ultimately cause significant water quality impairment. Similar to tailwater, tile drain water with elevated nitrate levels has been found draining into surface water bodies. Nitrate concentrations in selected waterbodies in the Pajaro Valley Watershed have been found to range from 19 to 89.5 mg/l NO₃ as N (compared to the drinking water standard, 10 mg/l).

Pesticides have been detected in agricultural tailwater and routinely exceed the toxicity water quality standard (lethal to aquatic life). Regionwide, CCAMP and the Cooperative Monitoring Program have conducted toxicity monitoring in 80 streams and rivers. Some measure of lethal effect (as opposed to growth or reproduction effect) has been observed at 65 percent of the water bodies monitored.

E. Summary of Draft Environmental Analysis Pursuant to CEQA

The Draft Environmental Analysis is discussed in Appendix H.

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